



FRIDAY, MAY 23, 1879.

Water Filter and Lime-Catcher for Locomotives.

A device designed to purify the feed-water has been applied to a number of locomotives on the Illinois Central Railroad, from which results have been obtained that warrant the belief that the deposit of scale in boilers can be greatly diminished, if not entirely prevented.

In the absence of a better name it has been termed a "filter and lime-catcher."

The construction and application of the device will be readily understood from the accompanying engravings, which are: Fig. 1, a transverse section, and fig. 2, a side elevation of the front dome on a locomotive boiler.

Instead of admitting the feed-water into the boiler in the usual manner (that is, on the side of the boiler, below the water level), the feed-water pipes are carried from the

ward dome has been made use of for the filter. As ordinarily constructed, this dome is rather small to attain the best results with the filter. Where the surface for deposit is limited, the space becomes rapidly filled up, and necessitates frequent cleaning. When a dome has to be made especially for the purpose, as in the case of an engine having but one dome, it is made much larger than the usual size, which gives better results, as by having the water pass over a large surface of highly heated metal the deposit of impurities is more complete.

Experiments were made with a large number of different substances to determine which was the most suitable for accumulating the impurities. It was found that oyster shells would retain the deposits to a greater extent than any other substance; but, by reason of the difficulty of obtaining them in sufficient quantities to insure a regular supply, and in consequence of their cost, their use was given up. A good substitute was found in rough scrap iron, which is now used almost exclusively. Charcoal, in small pieces, is better adapted for filtering the water; that is, purifying it of the earthy impurities held in suspension; but as it has been found that such impurities can be easily removed from the boiler by washing, there is not the same necessity for retaining them in the dome as there is with the mineral impurities. Charcoal at present is not used, the entire space in the dome

Central Railroad, and is the result of a long series of experiments made to prevent the formation of scale in locomotive boilers. It has been placed on 23 locomotives belonging to that company, and is being applied to others as they are being sent to the shops for repairs.

Various minor improvements are being made in the attachments, connections, etc., but the principle has remained unchanged.

The device has been patented in this country, Canada, England and Europe.

Train Accidents in April.

The following accidents are included in our record for the month of April:

REAR COLLISIONS.

On the morning of the 2d a shifting freight train ran into the rear of a passenger train in the Pennsylvania yard at Altoona, Pa. Only slight damage was done.

On the evening of the 7th a freight train on the New York, Lake Erie & Western road ran into some cars which had broken loose from a preceding freight near Otisville, N. Y. The engine and a caboose were damaged, and one track blocked four hours.

On the morning of the 9th a passenger train on the Pennsylvania Railroad ran into a preceding passenger train at the Mt. Holly Branch junction near Burlington, N. J. One car was damaged.

Very early on the morning of the 10th a freight train on

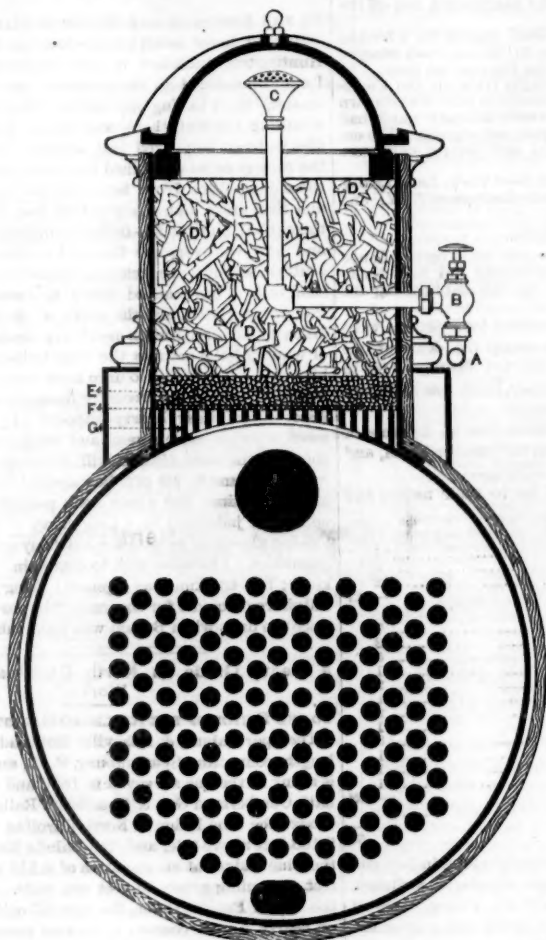


Fig. 1.

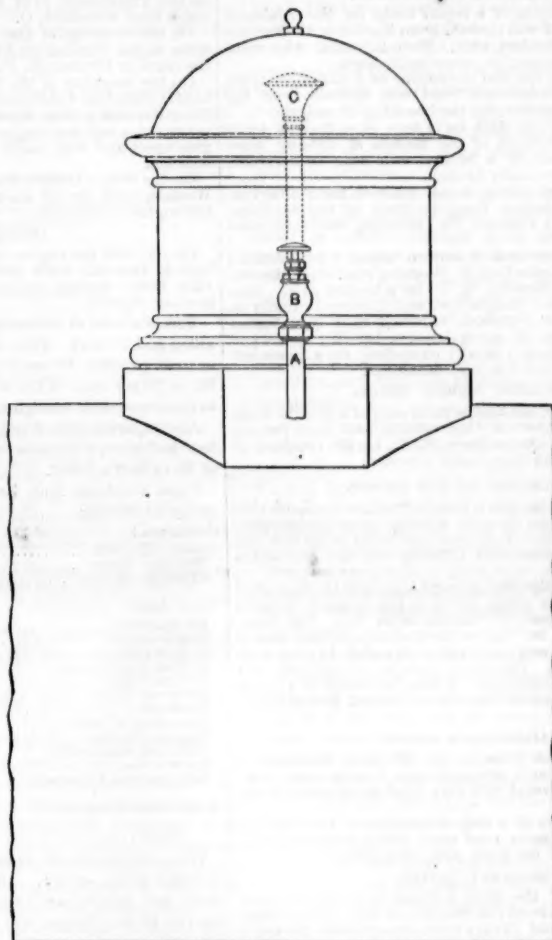


Fig. 2.

WATER FILTER AND LIME CATCHER FOR LOCOMOTIVE BOILERS.

pumps, or injectors, to the top of the forward dome, either inside or outside of the dome, and deliver the water near the top of the dome from a rose, C, in the form of spray or thin sheets. From this point it falls into the body of the boiler by its own gravity, and in its descent is compelled to pass over and among pieces of metal, wood, charcoal, tile, oyster shells, D, D, or other suitable substances, which are placed in the dome and are heated to the same temperature as the steam which surrounds them, and upon which the lime, magnesia and other mineral impurities in solution in the water will deposit themselves. These pieces of metal, etc., are supported by a grating, G, over which is laid, if necessary, a piece of wire netting, F, to prevent the charcoal, E, from being washed through into the boiler.

When the pieces of metal have become incrustated to a certain extent, they are taken out, cleaned in a tumbler and put back. The length of time that is allowed to pass between each cleaning of the filter will depend upon the amount of mineral impurities in the water and the nature of the service in which the engine is employed. This period will vary in different sections and on different roads.

In using the filter it was found advantageous to take the water through an injector. The pump delivers the water at its natural temperature, but the water supplied by an injector is thrown into the boiler at a temperature of nearly 200 degrees. The result is that the temperature of the steam in the dome is reduced to a much less extent than it is by the introduction of cold water, and as the pieces of metal over which the water passes are hotter, the separation and deposit of the mineral impurities are more thorough and complete.

On the Illinois Central Railroad nearly all of the locomotives have two domes, and, for the sake of economy, the for-

ward dome has been made use of for the filter. As ordinarily constructed, this dome is rather small to attain the best results with the filter. Where the surface for deposit is limited, the space becomes rapidly filled up, and necessitates frequent cleaning. When a dome has to be made especially for the purpose, as in the case of an engine having but one dome, it is made much larger than the usual size, which gives better results, as by having the water pass over a large surface of highly heated metal the deposit of impurities is more complete.

Experiments were made with a large number of different substances to determine which was the most suitable for accumulating the impurities. It was found that oyster shells would retain the deposits to a greater extent than any other substance; but, by reason of the difficulty of obtaining them in sufficient quantities to insure a regular supply, and in consequence of their cost, their use was given up. A good substitute was found in rough scrap iron, which is now used almost exclusively. Charcoal, in small pieces, is better adapted for filtering the water; that is, purifying it of the earthy impurities held in suspension; but as it has been found that such impurities can be easily removed from the boiler by washing, there is not the same necessity for retaining them in the dome as there is with the mineral impurities. Charcoal at present is not used, the entire space in the dome

being filled with pieces of metal resting directly on the grate at the bottom.

The essential point is to have a substance with a rough, rather granular surface. Pieces of finished iron were tried, but without success, the deposits failing to adhere to the smooth surfaces.

The amount of scale found in the filter does not represent all the foreign matter contained in the water that passes through it. It appears that the mineral impurities only attach themselves to the surfaces of metal and that the earthy matter, or a large portion of it, goes through the filter and into the boiler; but after being separated from the lime (which remains in the filter), it will not harden on the flues, furnace sheets, etc., but falls in separate particles to the lower part of the boiler and is easily removed by washing out. The quantity of mud washed out is greater when the filter is used than when it is not, showing that without the separation which takes place in the filter, a portion of the earthy matter is baked upon the flues, etc., with the lime, magnesia and other mineral matter. The average quantity of mineral impurities removed from each filter per 1,000 miles run on the Chicago Division of the Illinois Central Railroad is 40 lbs., and it is estimated that an equal quantity of mud, in addition to the amount ordinarily removed by washing, is removed during the same time, making a total of 80 lbs. of impurities removed per 1,000 miles run, by use of the filter, that would otherwise have remained in the boiler.

From the filter of an engine in heavy freight service for a short time on the North Division of the same road, an average of 60 lbs. of scale was removed per 1,000 miles run.

This device is the invention of the Superintendent, Superintendent of Machinery and Master Mechanic of the Illinois

the Pennsylvania Railroad broke in two near East Rahway, N. J., and the rear section afterwards ran into the forward one, wrecking eight cars. The wreck was scattered over both tracks, blocking the road five hours.

On the night of the 11th a freight train on the New York, Lake Erie & Western road ran into the rear of a preceding freight at Otterkill, N. Y., wrecking a lot of coal cars and blocking both tracks four hours.

On the 14th a passenger train on the Western & Atlantic road ran into a box car standing on the track in Atlanta, Ga., wrecking the car and damaging the engine and three passenger cars. The engineer was hurt.

On the morning of the 16th a freight train on the Pittsburgh, Wheeling & Kentucky road struck the rear end of a passenger train at Short Creek, W. Va., doing a little damage.

On the morning of the 16th a freight train on the New York, Lake Erie & Western road ran into a preceding freight near Middletown, N. Y., wrecking a number of cars and blocking one track three hours.

On the morning of the 17th a passenger train on the Delaware road ran into some freight cars standing on the track near Dover, Del. The cars were damaged and the conductor of the passenger train hurt.

On the afternoon of the 17th a passenger train on the Central Railroad of New Jersey ran into the rear of a freight train near Asbury, N. J. The engine was wrecked, the baggage car pitched down a high bank and badly broken, and several freight cars damaged. Three train-men were hurt.

On the 18th a freight train on the Atlantic & Great Western road ran into some cars which had broken loose from a preceding freight near Meadville, Pa., wrecking the caboose and damaging the engine.

On the afternoon of the 24th a passenger train on the Metropolitan Elevated road ran into the rear of a preceding passenger train near the Chambers Street station in New York. The engine and a car were damaged.

On the 25th, as a freight train on the Utah Southern was making a flying switch at York, Utah, the switch was not

closed quickly enough and the detached cars ran into the engine. Two cars and the tender were damaged.

On the 29th a freight train on the Lehigh Valley road ran into the rear of a coal train near Pattenburg, N. J., wrecking the caboose and injuring two brakemen badly.

BUTTING COLLISION.

On the 12th a freight train on the Atchison, Topeka & Santa Fe road ran into the head of another freight train which was going into a siding at Wakarusa, Kan. Both engines and several cars were badly damaged.

CROSSING COLLISIONS.

On the 3d an Atlantic & Great Western freight ran into a coal train on the Youngstown Branch of the Lake Shore & Michigan Southern at Lattimore Crossing, O. Five coal cars and the Great Western engine were badly broken. It was snowing very hard at the time, so that the signal could not be seen.

On the morning of the 9th a freight train on the Indianapolis & Vincennes road ran into a freight train on the Belt road at the crossing of the two in Indianapolis, Ind. The Vincennes engine and two cars of the other train were badly broken.

DERAILMENTS, BROKEN RAIL.

On the morning of the 7th the emigrant cars of a passenger train on the Central Pacific road were thrown from the track by a broken rail near Lovelock's, Nev. One car was wrecked, a passenger killed and two others hurt.

On the morning of the 9th a passenger train on the Central Railroad of Georgia, was thrown from the track by a broken rail near Station No. 9, Ga. The engine was damaged and the road blocked six hours.

DERAILMENTS, BROKEN AXLE.

On the 21st the engine of a repair train on the Alabama Great Southern road was thrown from the track at Nance's Station, Ala., by a broken axle. Two laborers, who were riding in front of the engine, were badly hurt.

On the morning of the 25d the engine of a passenger train on the Junction & Breakwater road was thrown from the track in Georgetown, Del., by the breaking of an axle.

On the morning of the 24th three cars of a freight train on the Ware River Branch of the Boston & Albany were thrown from the track by a broken axle near Gilbertville, Mass. The cars were badly broken.

On the 26th several cars of a coal train on the Pennsylvania Railroad were thrown from the track by the breaking of an axle near Blair Furnace, Pa., blocking the track some time.

On the afternoon of the 26th several cars of a freight train on the New York, Lake Erie & Western road were thrown from the track near Howells, N. Y., by a broken axle. One of the cars, an oil tank, caught fire, and it spread rapidly to others, burning up four oil-tank cars and four cars loaded with wheat. The fire did much damage, burning up ties and fences, twisting rails and finally extending to a house adjoining the track, which was also destroyed.

DERAILMENT, BROKEN TRUCK.

On the afternoon of the 21st several cars of a freight train on the Rome, Watertown & Ogdensburg road were thrown from the track near Ogdensburg, N. Y., by the breaking of a truck, and three cars were badly wrecked.

DERAILMENTS, BROKEN BRIDGE.

On the morning of the 4th a freight train on the Louisville & Nashville road broke through a bridge near Brownsville, Tenn., and the engine and several cars went down into the river, killing the engineer and injuring the fireman and a brakeman.

On the morning of the 19th a freight train on the Hannibal & St. Joseph road was going down a heavy grade when a trestle bridge just ahead was seen to be on fire. The train could not be stopped, but ran on the trestle and had nearly crossed when it gave way, and the engine and 14 cars went down in a bad wreck. The wreck caught fire at once and was almost entirely destroyed. A man in charge of a car of household goods was killed; the conductor and another man were badly hurt.

DERAILMENTS, WASH-OUT.

On the 16th a freight train on the Western Railroad, of Alabama, ran into a large wash-out near Louchapoka, Ala., and the engine and several cars were piled up together in the gap.

On the 23d some cars of a passenger train on the International & Great Northern road went into a wash-out near Austin, Tex. Part of the train went over safely.

DERAILMENT, CATTLE.

On the evening of the 20th a repair train on the Terre Haute & Indianapolis road ran over a cow near Greencastle, Ind., and the engine and 13 cars were thrown from the track and damaged. The engineer, fireman and a brakeman were badly hurt.

DERAILMENT, SPREADING OF RAILS.

On the night of the 15th five cars of a freight train on the Housatonic road were thrown from the track by the spreading of the rails near Rockdale, Mills, Conn. Some of the cars upset and the caboose caught fire and was burned, with one car adjoining. A lot of stock was killed. Two trainmen were hurt, but not badly. The road was blocked all night.

DERAILMENTS, MISPLACED SWITCH.

On the evening of the 1st two cars of a freight train on the New Haven & Northampton road were thrown from the track in New Haven, Conn., by a misplaced switch. The cars were thrown across the track, blocking it for several hours.

On the morning of the 3d a passenger train on the Freehold & Jamesburg road was thrown from the track by a misplaced switch at Lower Jamesburg, N. J. The engine upset, injuring the engineer badly.

On the evening of the 7th the engine and six cars of a freight train on the New York Central & Hudson River road were thrown from the track in Rochester, N. Y., by a misplaced switch.

Late on the night of the 14th the engine and six cars of a freight train on the New York, Lake Erie & Western road were thrown from the track by a misplaced switch at Turner's, N. Y., blocking both tracks three hours.

On the night of the 23d the engine and one car of a passenger train on the Baltimore & Ohio road were thrown from the track in Baltimore, Md., by a misplaced switch.

DERAILMENTS WITH MALICIOUS INTENT.

On the night of the 5th a freight train on the Baltimore & Ohio road was thrown from the track near Mt. Savage Junction, Md., where a switch had been purposely misplaced by some person unknown. The engine upset and the engineer and fireman were hurt.

On the night of the 5th a passenger train on the Cleveland, Columbus, Cincinnati & Indianapolis road was thrown from the track in Brightwood, Ind., by a switch, which is believed to have been purposely misplaced. The engine and several cars were damaged.

On the morning of the 8th a freight train on the Chicago, Milwaukee & St. Paul road ran into a tie which had been

stuck in a cattle guard near Grand Meadow, Ia., by some person unknown. The engine and five cars were wrecked.

On the morning of the 17th a freight train on the Housatonic road was thrown from the track by a misplaced switch at Pine Grove Camp Ground, Conn. The engine and five cars were badly broken. The switch is believed to have been purposely set wrong.

DERAILMENTS, UNEXPLAINED AND MISCELLANEOUS.

On the morning of the 1st as an express train on the Eastern road, drawn by two engines, was passing North Beverly, Mass., the forward engine jumped the track and the second one followed it. Both engines were badly broken and two express cars and the baggage car were piled up on top of them in a bad wreck. The other cars left the track, but were only slightly damaged. The accident is believed to have been caused by ice gathering in a frog and being packed down hard. The damage to equipment is estimated at \$25,000.

On the morning of the 3d the engine and three cars of a passenger train on the Chicago, St. Louis & New Orleans road ran off the track near Hazlehurst, Miss. The engine was damaged, the engineer killed and the baggage-master badly hurt.

On the morning of the 6th eight cars of a freight train on the Wabash road were thrown from the track at Delphi, Ind., and several were completely wrecked.

On the morning of the 7th a car in a freight train jumped the track in the Atlantic & Great Western yard, at Cleveland, O. A brakeman was slightly hurt.

On the 15th some cars of a freight train on the Jamesville & Washington road ran off the track near Jamesville, N. C.

On the morning of the 24th some cars of a freight train on the Pittsburgh, Fort Wayne & Chicago road ran off the track near Mansfield, O.

On the evening of the 24th a dead engine in a freight train on the Pittsburgh, Ft. Wayne & Chicago road jumped the track in Pittsburgh, Pa., blocking the road an hour.

On the morning of the 28th a freight train on the Cleveland, Columbus, Cincinnati & Indianapolis road was thrown from the track near Shelby, O., where a track gang had taken out a rail and neglected to put out signals. The engine upset and was badly damaged and several cars were wrecked.

On the 30th a freight train on the New York, Lake Erie & Western road ran off the track near Lancaster, N. Y., and the engineer was hurt.

OTHER ACCIDENTS.

On the 15th the engine of a passenger train on the Louisville & Nashville road broke a connecting rod near Nashville, Tenn., tearing up one side of the cab and injuring the fireman slightly.

This is a total of 50 accidents, whereby four persons were killed and 27 hurt. Four accidents caused the death of one or more persons; 12 caused injury but not death, while in 34, or 68 per cent. of the whole number, there was no injury to persons serious enough to be recorded.

As compared with April, 1878, there was an increase of four accidents, a decrease of eight in the number killed, and of 28 in that injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:	
Rear collisions.....	14
Butting collisions.....	1
Crossing collisions.....	2
DERAILMENTS:	
Unexplained.....	7
Broken rail.....	2
Broken axle.....	5
Broken truck.....	1
Broken bridge.....	2
Cattle on track.....	1
Wash-out.....	2
Spreading of rails.....	2
Misplaced switch.....	8
Malicious obstruction.....	1
Snow or ice.....	1
Rail removed for repairs.....	1
Broken connecting-rod.....	32
Total.....	50

Three collisions were caused by trains breaking in two and one by a flying switch. Of the eight misplaced switches, three are said to have been purposely set wrong. One of the two broken bridges was a wooden trestle and was on fire when it gave way; concerning the other we have no particulars. Fifteen accidents are traced directly to defects or failures of road equipment.

The division of accidents and casualties according to classes of trains was as follows:

Accidents:	Collisions.	Derailments.	Other accidents.	Total.
To passenger trains.....	2	9	1	12
To a passenger and a freight.....	5	..	..	5
To freight trains.....	10	23	..	33
Total.....	17	32	1	50
Casualties:				
Killed by.....	..	4	..	4
Injured by.....	7	10	1	27
Total.....	7	23	1	31

The month showed some singular features, one of which is that only a single butting collision is recorded, though the number of rear collisions is proportionately as great as usual and there are two crossing collisions, more than we usually record. There is also a considerable number of broken axles, though other breakages of iron are comparatively few. Ice still lingered enough to cause one accident, but the effects of winter were almost gone, and it certainly was not cold enough to cause axles to break. Five carelessly misplaced switches are a discouraging number, and four derailments purposely caused are also a bad feature. Three of these were caused by switches willfully set wrong, and only one by a malicious obstruction. Once more we have that inexcusable piece of carelessness, the removal of a rail by trackmen without setting proper signals.

One of the most frequent causes of rear collisions seems to be the lack of sufficient care in securing a safe interval between freight trains running in gangs. Too often, it would seem from the accounts we receive, when a train breaks in two, or a slight accident requiring a stop occurs, there is no time to send back a signal, and the following extra strikes the disabled train almost without warning. This is no new

thing, and it certainly seems that more precautions might be taken in this respect.

For the year ending with April the record is as follows:

	No. of accidents.	Killed.	Injured.
May.....	50	13	44
June.....	58	12	58
July.....	54	7	41
August.....	75	36	108
September.....	70	22	53
October.....	61	35	163
November.....	68	15	54
December.....	63	10	58
January.....	113	23	90
February.....	88	11	75
March.....	61	14	50
April.....	50	4	27
Totals.....	815	208	821
Totals, same months, 1877-78.....	798	225	970

The averages per day were, for the month 1.67 accidents, 0.13 killed and 0.90 injured; for the year, 2.23 accidents, 0.57 killed and 2.25 injured. The average casualties per accident for the month were 0.080 killed and 0.540 injured; for the year they were 0.255 killed and 1.007 injured. The casualties for the month were very few in number, the least that we have recorded in many months.

Contributions.

Rail Sections—The Road-Masters' Association.

MAY 12, 1879.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having been much interested in the letters of Mr. Huntington, published in the *Gazette* from time to time. I am constrained to congratulate the fraternity of road-masters upon having one among them who takes notes and is willing to print them, and at the same time indorse the idea as to an improved rail section. Thirty-five years ago the rails came to us pitched to fit the wheels, and the iron in those days were from ten to twelve years, as against four and five now; but the practical had to give way to the theoretical, and the flat-footed round-top rail was the result; and now we overcome theory by adding the ties to get a central bearing. In relaying some 70 miles of track with steel rail. I have adzed every tie, using templates to get the proper pitch, and the result is eminently satisfactory. Many of Mr. H.'s ideas meet my hearty concurrence, but of which I have not now the time to speak. Before closing, however, I would like to urge upon road-masters the importance of giving the recently inaugurated "Road-Masters' Association" their hearty support. It will do us good to meet together once a year and exchange ideas and experiences; at the same time it will brace us up to hold our own when we come to pit practice against theory. How many of us have time and again been pushed to the wall against our better judgment by a long array of figures or a terrific-looking algebraic proposition with any quantity of unknown quantities. I have no wish to complain. We are modest, I know; but trackmen as a general thing have not had their full share of credit for the many "improvements" introduced since the days when Boston was THE Hub. ***

A Heavy Grade in North Carolina, and How it is Worked.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The Spartanburg & Asheville Railroad, seventy miles in length, connecting Spartanburg, S. C., and Asheville, N. C., is a link in the line surveyed in 1836 and 1837 by the Cincinnati, Cumberland Gap & Charleston Railroad Company. It crosses the Blue Ridge in North Carolina at an elevation of 2,168 feet above tide, and the Saluda Range, an offshoot of the Blue Ridge, at an elevation of 2,113 ft. The gauge is 5 feet, the ruling grade 80 feet per mile. Near the head of the North Picolet River, the line following its south bank, on nearly a west course, it became necessary, in order to preserve the grade, to cross the stream and turning to the east to pass for five and a half miles along the slopes of Saluda Mountain, to its summit at the Howard Gap, elevated 1,875 feet above tide. From this gap the line for five miles lay upon the plateau of the mountain, near its crest, occasionally crossing it, its direction being northwest and west to Pace's Gap, where, leaving the summit of the ridge, elevated 2,113 ft. above tide, it descended to the valley of Green River. The estimated cost of the 10½ miles was, for grading, \$408,000, or \$460,346 to finish, exclusive of equipment. The poverty of the company and the conditions of its subscriptions beyond the mountains compelled it to abandon this portion of the line. Notwithstanding the great development of distance between Picolet Crossing and Pace's Gap, the air-line distance was only one and a half miles, and the difference in elevation 633 feet. The Picolet River and a small tributary heading in the gap fortunately afforded the development of a line three miles in length with a tangent grade of 237.6 ft., the amount of curvature being 546', and the total rise 605 ft. The location was adopted Oct. 20, 1875, and the grading was completed in a permanent manner for the sum of \$51,312. The road-bed has fair exposure to the sun. A tank at the summit and one near the foot of the grade are supplied by natural flow with pure water. The sharpest curvature is 11', the ruling maximum on the road; and the longest of that character is nearly nine hundred feet. The reduction for curvature is 0.05 on all the light curves. Those of 8', 10' and 11' were reduced 0.06, 0.07 and 0.08, the long 11' mentioned being allowed 0.09 per 100 ft. per degree of curve. An ordinary 18-ton engine was used in laying track. The line has been operated ten months, the track extending now 13 miles north of Pace's Gap to Hendersonville, N. C. The road not yet reaching its northern terminus, the business has not justified a pusher for the steep grade; and the entire line has been operated with a 35-ton Mogul—30 tons on the drivers. She has taken

up the grade at a speed of eight or nine miles per hour a gross load of 161 tons, occasionally slipping her wheels when the rails were in bad order from dew or light rain. Average steam, 160 lbs. or 165 lbs. Although the wheel base (15' 3" rigid) is too great, the reduction for curvature seems nearly right, though ample; the engineman reports that the pull on curves is a little tighter than on tangents. The trains, however, are short. Six flats, carrying each 45 rails 30 feet long (50 lbs. per yard), is a fair load (115 tons), making length of train about 250 feet.

In the first case mentioned, allowing 8 lbs. per ton rolling friction for the gross load minus weight on drivers, and adding 90 lbs. per ton of gross load for gravity, the total resistance was $131 \times 8 + 6 \times 90 = 15,538$, and the adhesion $15,538 \div \frac{1}{4} \text{ nearly} = 60,000$.

The time of the light passenger train—one light coach and baggage and mail car combined—is from ten to fifteen minutes, though the run has been made with one coach in seven minutes. No difficulty has attended the descent. An air-brake on the tender and the common brakes on the cars easily control the train. The inclination of the boiler necessitates close attention to the gauge cocks. The engine has more power backing up the grade probably on account of using drier steam.

The operative value of this line compared with that of the other may be stated thus (using figures from Mr. Wellington's excellent treatise):

Exact difference of cost of grading and superstructure.....	\$392,500
Difference in distance by measurement.....	7.3 miles.
" " " curvature.....	1.7 "
" " " rise and fall on.....	1.133 "
plateau.....	0.06 "

Total equivalent distance.....	9% miles.
Capitalized value at 7 per cent. of 9% miles = (train mile cost assumed, \$1) $\$3,900 \times 9\% = \$37,700$ per daily round trip per annum for 8 daily trains $\$37,700 \times 8 =$	\$301,600
Total.....	\$694,100
Capitalized value of 3 miles operated by assisting engine making 8 daily round trips (= 48 miles) is, at 7 per cent. (and allowing 10% per cent. addition to cost on account of idle time of engine), $\$5,091.33 \times 3 \times 8 =$	\$122,192
Add cost of engine.....	8,000
	130,200

Difference in round numbers.....	\$504,000
For 5 daily trains—say 2 passenger and 3 freight—difference in round numbers.....	\$497,000

(Assuming train mile cost as before, and that the engine would employ the otherwise idle time on the adjacent work; or, if not, add 42 per cent. to cost of the assisting engine mileage, and difference is $= \$480,000$)

Imperative force of circumstances wrought the conception of this line as a means of temporary relief from difficulties that threatened the defeat of an enterprise fondly entertained by its friends for forty years. The location was not finished before it became evident that under any circumstances the short line was the true one.

These notes are contributed as a small addition to that valuable experience of the profession, which warrants the assurance that high summits and rude approaches can no longer defy the well-directed energies of even limited capital seeking to unlock the treasures guarded by mountain fastnesses. T. COLEMAN, Chief Engineer S. & A. R. R.

GREEN RIVER, N. C., May 12, 1879.

Uniform Accounts.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In considering what form should be adopted according to which all railroads should be required to make a uniform report of their earnings and expenses, it should not be overlooked that in order to continue comparisons with previous years, which railroad officers and stockholders will of course desire to do, it will be necessary that accounts be so kept that the results may be shown according to the old forms hitherto in use as well as by the new. According as these forms vary, more or less, so will additional labor and expense be required, and in order to secure the hearty co-operation of railroad officials, without which any uniform scheme will have but a poor chance of ultimate success, it is at least desirable, if not indispensable, that as little deviation as possible be required from existing forms and methods.

The general dislike by railroad men of the Massachusetts plan arose mainly from its great divergence from the forms and methods generally in use, its most objectionable feature being the required separation of all expenses between freight and passenger business on a fixed arbitrary basis for all roads alike. The insuperable objections to such a separation have been so often pointed out that it is unnecessary to recapitulate them here, and I am surprised that Mr. Towne should offer for adoption a system which is in nearly all respects as arbitrary as that introduced by the Massachusetts Commissioners. To make, as Mr. Towne does in the main, the relative freight and passenger earnings the basis of a corresponding separation of a very large portion of the expenses, is putting the cart before the horse, and instead of showing the actual cost of doing certain business, make the business itself the basis of the cost. As no real or even reliable approximate results are shown by such a method, what is the use of insisting upon it?

The main features which should characterize any initial form put forth for general adoption should be definiteness and simplicity; brevity, but not so brief as not to furnish all needed information; order in the arrangement of the various items, having a proper regard to their relation to each other, and last, but not least, conformity, as far as practicable, with the forms and methods now generally in use. In regard to the latter, I think a comparison of various existing forms will show that there is a much closer

correspondence than is generally supposed, the principal differences being in the order of arrangement, or in the condensation of two or more items into one, which in either case could be easily adjusted to conform to each other.

To whatever extent brevity may be carried, the expenses for maintenance of way and maintenance of rolling stock should be separately shown from all other expenses, if for no other reason than that they may not, and often do not, bear a proper relation to the earnings for the particular period reported. A good year may be made to appear, either unavoidably or purposely, better than it should be by delaying until another year the complete and proper repairs, which, owing to the increased business or other causes, the track and rolling stock require; or, on the contrary, a bad year may be made to appear worse, by charging against its earnings a large amount for repairs which legitimately belonged to a previous year's business. In short, no one, whether railroad official, commissioner, or stockholder, can form any proper idea how any railroad has been managed, unless the expenses charged for maintenance are distinctly known.

For this reason, one of the main divisions adopted by a large number of roads, viz., "Motive Power," has always appeared to me defective, because the expenses covered by that one item include the cost of repairing locomotives as well as the other costs of running the same; besides which the wages of engineers and firemen are as much an expense for "Conducting Transportation" (another main division generally used by the same roads) as the wages of conductors and train-men.

Having thus found fault with others, I will now lay myself open to criticism by submitting the following form, which I have endeavored to arrange in accordance with the principles stated above:

EXPENSE ACCOUNTS.

1. Repairs of roadway and track.....
2. Renewal of track, cost of cross-ties, cost of rails less the current value of old rails taken up.....
3. Repairs of fences and crossings.....
4. Repairs of bridges.....
5. Repairs of buildings and shops.....
6. Repairs of freight cars.....
7. Repairs of passenger, mail and express cars.....
8. Repairs of locomotives.....
9. Locomotive service, wages, engineers, firemen and wipers.....
10. Locomotive supplies—fuel.....
11. Locomotive supplies—oil, waste, and all other supplies.....
12. Water stations—service and expenses.....
13. Train service and expenses.....
14. Telegraph service and expenses.....
15. Station service and expenses.....
16. Superintendent of Traffic and Transportation—Salaries and expenses of Division Superintendents, Traffic Managers, General Freight and Ticket Agents, Car Accountants, their clerks and offices.....
17. Stationery, printing, and tickets.....
18. Rentals of station and other buildings used in connection with transportation and traffic.....
19. Loss and damage.....
20. Miscellaneous, all expenses not otherwise provided for.....
21. Car-mileage.....
21. General offices—Salaries and expenses of all general officers, their clerks and offices, except as provided for in account No. 16.....
23. Legal expenses.....

INCOME AND PROPERTY EXPENSES.

24. Insurance.....
25. Taxes.....
26. Rentals of leased lines.....
27. Rental of rolling stock.....
28. Interest on bonded indebtedness.....
29. Dividends declared.....

An examination of this form will show that the items have been carefully arranged in such relative order to each other as to be most readily available for the different kinds of statistics usually required; besides which, the arrangement is such as to admit of a condensed statement (somewhat similar to those referred to by Mr. Shinn), by merely adding certain of the items together in the order in which they stand. Thus, items Nos. 1 to 5 form "Maintenance of Way and Buildings;" Nos. 6 to 8 "Maintenance of Rolling Stock" (or Maintenance of Cars and Locomotives may be stated separately); Nos. 9 to 20, "Conducting Traffic and Transportation;" No. 21, "Car-Mileage;" and Nos. 22 and 23, "General Expenses."

Those who are accustomed to the classification of "Motive Power" and "Conducting Transportation" will also find all the items relating to the former, except repairs of buildings used for motive power purposes, in items 8 to 12, and the items usually included in "Conducting Transportation" in Nos. 13 to 21. In any general uniform system, however, car-mileage should be specifically stated, for the reason that it forms a large item in the expenses of many roads, and is of such a nature, that it does not solely belong to any one main division of the accounts.

The charge is not altogether the same as "Rental," for when cars are rented, the road renting them has to keep them in repair; it is therefore rather an expense, partly chargeable to repairs of cars and partly chargeable against income, as interest on the money invested in the cars by other roads.

The ordinary method of charging to expenses the difference only between the amount earned and the amount due is inapplicable to a uniform system, because some roads receive more than they pay; beside which the expense for car-hire is so heavy on some roads, and the receipts so large (as for example on the New York Central, whose last annual report shows \$888,462.46 credited to earnings and \$1,673,719.99 charged to expenses, for car-hire), that unless both items are known, any comparison made for the purpose of finding out their respective cost for doing business would be fallacious.

With the exception of a few accounts, I have given no details as to the items they are intended to cover, for the reason that I have thought the names of the accounts sufficiently indicated what should be charged to them.

I would suggest that it would be well not to attempt too much at first, but rather, to allow a reasonable latitude for difference of opinion as to some doubtful items and for dif-

ference of practice with reference to the same. If a set form can once be established as the basis for all reports, it will be comparatively easy at a future time to make the uniformity more exact, if found desirable so to do.

Repairs of tools and machinery I have omitted from the account; enumerated because I agree with Mr. Leland that the cost of such repairs should be pro-rated on the work done, the same as shop expenses.

With regard to permanent improvements, some conservative roads charge a large proportion of all such improvements to the ordinary expenses of repairs; but if they are treated otherwise, either by charging them against income or by adding them to the cost of construction, and increasing the capital or bonded account correspondingly, the basis of such charge should, in my judgment, be that laid down by Mr. Shinn and Mr. Ford, and not that stated in Mr. Goodspeed's instructions.

Having trespassed so much on your space, I will very briefly refer to the statement of earnings and statistics. I have already intimated that the gross amount earned from the hire of cars should be specifically stated.

In the separation of local and through passengers and freight, and in the statistics of mileage required for the same, if to be made up on the basis of instructions No. 6, printed in your issue of May 2, but which I find not repeated in your issue of the 9th, an impossible work is required. When passengers travel on coupon tickets, and when freight going over two or more roads is billed through to its destination without being rebilled at any intermediate point, the information can of course be easily furnished; but if otherwise, the information as to passengers cannot be furnished at all, and the information as to freight could only be obtained with great labor and expense.

The method of determining what is through and what is local business, in accordance with the tariff used for the same, is totally different from the basis used for the statistics of such business by any road known to me, and would occasion a vast amount of additional labor and expense—far greater than those who are unacquainted with the making up of freight accounts and statistics have any idea of. The places at and from which freight is received and forwarded, now form the basis for arriving at what is called through and local business, and this basis is simple and definite. J. P. W.

Simple Questions as to a Crossing on a Grade.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Having seen in your very valuable paper many opinions of friction in regard to frogs and switches, also car brakes, please allow me to ask one simple question.

Suppose the grade of track to be 52 ft. per mile and curve 10 degrees, distance one mile. Grade changes at top of hill, running down opposite side same distance, same curve and same grade—52 ft. to mile. What would be the effect of two frogs and switches, also frogs and guard rails, for a railroad crossing near summit—crossing and switches within 500 feet of summit? The state law compels all trains to come to a full stop 400 ft. before crossing another road, which would leave our train standing on the two frogs and switches on the above-described curve and grade. How many cars can an engine pull up the above-described track and stop for the crossing, and how many can same engine pull and not stop for crossing? How many cars can an engine pull over the same track without the two frogs and switches and railroad crossing being there, and how many if they are there? What is the friction resistance of frogs and switches and railroad crossings to trains?

There have been a great many different opinions on the above. Please give answer in your very valuable paper.

[If any reader feels able and willing to answer the above "simple question," we will be only too willing to publish his answer for the benefit of this correspondent and the world at large.—EDITOR RAILROAD GAZETTE.]

Reading's Entry into New York.

PHILADELPHIA, May 17, 1879.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The lease by which the Philadelphia & Reading Railroad Company so quietly and suddenly came into possession of the North Pennsylvania and the Delaware & Bound Brook railroad companies, with all their real estate, rolling stock, property and franchises, marks the first step of the Reading Company out its own state, gives it the control of a third freight and passenger station in the heart of the city, a large wharf and water front, and removes a competitor for freight and passengers from the coal regions and for freight from the West over the New York, Lake Erie & Western and the New York Central. It also gives the Reading control over the direct outlet of the Lehigh Valley Railroad Company into the city and the control of two-thirds of the New York & Philadelphia New Line and a line of its own to tide-water at Port Elizabeth and Port Johnston through a running connection with the Central of New Jersey.

The North Pennsylvania was chartered April 8, 1852, and opened July 7, 1857. It owns a main line to Bethlehem, 55.6 miles in length with 26.3 miles of double track; the Delaware River Branch from Jenkintown to Yardley in the middle of the Delaware River, 30.5 miles double track; the Doylestown Branch from Lansdale to Doylestown, 10.3 miles; and the Shimersville Branch from Iron Hill to Shimersville, 1.8 miles, making in all 88.2 miles of main line and branches, of which 46.8 are double track. It also

operates under a percentage contract, the Northeast Pennsylvania, from Abington to Hartsville, 9.8 miles, and the Stony Creek Railroad, from Lonsdale to Norristown, 10.3 miles, making the total owned, leased and operated 108.3 miles. The company has a capital stock of \$4,264,350 and convertible scrip to the amount of \$177,823 outstanding. Its bonded debt amounts to \$6,017,000 as follows: 6 per cent. first-mortgage bonds due Jan. 1 1855, \$1,930,500; 7 per cent. second-mortgage bonds, due May 1, 1896, \$1,500,000; 7 per cent. general mortgage bonds, due Jan. 1, 1893, \$2,569,500; 6 per cent. income bonds, due April 1, 1877, \$17,000. There is also a floating debt of \$1,104,925.

The Delaware & Bound Brook Railroad Company was chartered May 11, 1874, and opened May 1, 1876. It has a double track of 27 miles in length, extending from the north Pennsylvania at Yardley to Bound Brook, with a branch to Trenton 3.7 miles in length. It has a capital stock of \$1,514,000 and a funded debt of \$1,500,000 7 per cent. first-mortgage bonds, due Aug. 1, 1905, and a floating debt of \$279,620.

These are the two roads that have been leased to the Reading for 990 years on terms not yet fully known in all their details. Nevertheless, their substance is that the Reading is to assume all the liabilities of both companies except the floating debt, which is to be carried at 6 per cent. until converted into capital stock or funded not below par; also to pay a net dividend of 6 per cent. on the capital stock of both companies quarterly on the first of May, August, November and February for the first two years, 7 per cent. for the next two, and 8 thereafter during the continuance of the lease, free of all taxes; also a sum sufficient to keep up the organization of both companies.

The consummation of this lease is due to the anxiety of Mr. Gowen to get a winter outlet for coal and to the anxiety of Mr. E. C. Knight to realize upon investments which have been netting him nothing for some time. The scheme was first thought of a year ago, says Mr. Knight, but nothing was done about it until lately, when one or two clerks were taken into the confidence of the managers and the necessary figures brought together from the books upon which to conclude negotiations. Neither the General Agent of the New York & Philadelphia Line nor the Master of Transportation of the North Pennsylvania knew anything about it until it had taken effect. No one in the Reading office knew of it, and although Arlo Pardee is a director both in the North Pennsylvania and the Lehigh Valley, no one in the Lehigh Valley knew of it until the very day, and the officer who first heard of it in that company was the first to carry the tidings to the Pennsylvania Railroad office. Mr. Knight left the board of directors of the Pennsylvania Railroad Company some years ago and was the ruling spirit in the organization of the new line, which gave a competing road for the first time between the two cities. He was the largest owner in the Delaware & Bound Brook, a very heavy holder of North Pennsylvania stock and also of Central of New Jersey. When that road went into the hands of a receiver he was President, having been chosen to succeed John Taylor Johnston, and he had advanced considerable money in the vain hope of saving the road from insolvency. At that time he was also President of the Delaware & Bound Brook, owning the majority of the stock, and he was Vice-President of the North Pennsylvania. These three offices he still holds, no election on the Central of New Jersey having been held since Judge Lathrop assumed the receivership. According to the laws of the state no road can hold an election as long as its property is in the hands of a receiver. It is understood that some time or other Judge Lathrop is to assume control of the road as President rather than receiver, Mr. Knight standing ready to retire at any moment, as he only took the position temporarily. He expresses himself as satisfied that the road will earn for the Reading more than the guarantee. He calls attention to the fact that the passenger business must constantly increase, and that the lease gives them a right to enter upon the Connecting Railroad in Delaware avenue. He says that the expenses of the Bound Brook line have always been light, and that the business was rapidly increasing in volume. He also expressed the opinion that the right to use the Junction road would be granted by the courts. Mr. Knight is understood to have purchased from 20,000 to 30,000 shares of Reading within a fortnight at 10% to 18%, and he does not deny it. The stock is now steady at about 21%. In North Pennsylvania, of which he has such a large amount, the advance has been 4 or 5 per cent., and he has also succeeded in placing some of his Delaware & Bound Brook stock on the market at par. It had not been quoted at par on the market since February, 1877, when the road had not been in operation a year.

As to the success of the scheme, Mr. Gowen is as sanguine as usual. Two millions of tons of coal is the amount that he proposes to send over his new line, and this he expects to send at a saving of \$950,000 and to make at least a half million more on the increased output. An increased profit of a million and a half would be a very nice thing indeed for the Reading, and the lease would be a fine operation for it even if they only made half as much out of it. It is easy enough to find out very nearly what it will cost to meet the guarantee. The year's business on the Bound Brook for 1878 resulted in an increase of \$20,593 in the floating debt. The interest on the bonded debt and on the floating debt at 6 per cent. would require the disbursement of \$121,777. The North Pennsylvania paid in 1878 for interest, ground rent and taxes, \$518,303. Allowing \$5,000 for keeping up the Bound Brook organization and \$10,000 for the North Pennsylvania, the total fixed charges for the present year may be assessed at \$654,080. The dividend on the stock would call for \$357,370, to say nothing of taxes on it, making a total of \$1,011,450 for which the Reading Company would be liable.

To meet this the two companies had last year net earnings of \$119,022 for the Bound Brook and \$573,061 for the North Pennsylvania, making \$692,083 and leaving a deficit to the lessee of \$321,367. Mr. Gowen says that the utmost deficit that may be apprehended will not be over \$100,000, but with a million and a half increased earnings, as he says, he need not be troubled about an increased deficit of less than a quarter of a million on this lease.

Mr. Gowen expects to make a large increase of earnings for his road and to make something more on the passenger business. He may do that, but will the rates be remunerative? We may for all practical purposes consider the two roads as one in figuring on the result. Consider in the first place the profit on coal. The tolls last winter were 50 per cent. of the price realized at tide, which is now an average of \$2.25 a ton for Schuylkill white ash. If the railroad company got \$1.12 a ton, it would be equivalent to a trifle more than half a cent a mile, which would leave him a profit estimated at sixty cents a ton. The leased roads are both of the same character, double-track and steel rails, and the operating expenses were 56 per cent. on the Bound Brook, and 60 on the North Pennsylvania Railroad. In the first place there is nothing to be gained in economy. The cost of management of the Bound Brook has never been over \$5,000 a year and the general expenses last year were only \$23,896, or 2 1/2 per cent. of the gross earnings. The operating expenses of the Reading were 64.4 per cent., and its general expenses bore a much larger ratio to the gross receipts, so that it is not likely that anything can be saved; in fact, the North Pennsylvania was one of the most economically managed roads in the country. The only trouble has been that it has continued piling up debt and issuing scrip. In the last thirteen years it issued, first, dividends amounting to 15 per cent. convertible into 7 per cent. mortgage bonds; then dividends amounting to 33 per cent. convertible into stock, and lastly cash dividends of 17 per cent. The result has been that in the Centennial year with an increase of a quarter of a million in the gross earnings, the interest account jumped more than \$100,000. In 1876 the earnings fell off \$100,000, and instead of paying off the floating debt, then over three-quarters of a million, cash and scrip dividends of 3 per cent. each were declared. In 1877 with a decline of almost \$200,000 in the earnings, there was a still further increase of \$35,000 in the interest account, and without any expenditures for equipment there was a surplus of only \$66,239. Nevertheless, a cash dividend of 3 per cent. was declared and a scrip dividend of the same amount. Last year the earnings were about the same, but the reduction in the expenses was more than twice the loss in the gross, yet another increase of \$22,500 in the interest account cut the surplus down to \$54,757, and less than three thousand was spent in equipment. How this result was arrived at may be seen from the following table, showing the surplus available for dividends in each year with the additions to capital and debt account in the corresponding year:

Year.	Surplus.	Capital.	Debt.
1872.....	\$257,878	\$166,985	\$90,000
1873.....	195,644	200,290	413,500
1874.....	233,209	179,482	874,000
1875.....	160,527	272,100	465,000
1876.....	346,403	21,418	150,500
1877.....	66,328	49,841	29,000
Total.....	\$1,250,899	\$860,586	\$2,076,500

During these six years that the road was earning a surplus after interest and taxes the Company had expended \$373,678 for construction and \$579,257 for equipment. This left them a balance of \$306,964 really applicable to dividends, but they had paid on that account \$675,593 in cash, \$860,586 in stock, \$2,076,500 in funded debt and \$1,001,028 in floating debt. In other words, there was paid out to the stockholders in these six years in cash, stock and bonds, \$3,353,898. Such being the case, it is not at all surprising that the company reached the end of its tether. Last year its earnings were so large that they had been exceeded only three times in the history of the road and its net earnings had been equaled only four times. Its passenger and freight mileage had been only twice exceeded and the heaviest freight mileage ever known on the road was less than 3 per cent. greater; and yet so rapid had been the increase in the interest account—nearly 50 per cent. in three years—that the surplus was barely one per cent. on the stock.

As for the rumor that the Baltimore & Ohio is back of the move, President Gowen emphatically denied it. It was not object enough for the Reading to fight for a through line for the short haul that it would get. The Lehigh Valley will come in over the North Pennsylvania as before, under the same running contract. If there should happen to be any unpleasantness the Pennsylvania would be very happy to take them into West Philadelphia by the way of Philadelphia and Trenton over the Belvidere Delaware. As for the Western freight that the Lehigh now takes at Waverley and delivers to the Reading at Allentown, it may possibly be transferred to the Lehigh & Susquehanna division of the New Jersey Central, which will get it from the Erie at Scranton, but it is not at all likely. The Reading is now sure to get it all. The Lehigh Valley cares very little about the matter, for it has a prejudice for getting something when it carries freight. The Reading has a contract with the Central for trackage at four mills per mile on coal, the Reading furnishing the motive power. R. W. M.

Locomotive Wheels and Axles.

[Report of the committee on "The Best Form and Material for Locomotive Wheels and Axles" submitted at the twelfth annual convention of the American Master Mechanics' Association in Cincinnati, May 14, 1879.]

To the American Railway Master Mechanics' Association: GENTLEMEN: Your committee appointed to investigate

the subject of the best form and material for locomotive wheels and axles, have carefully considered the same, and submit the following as the result of their labors. In discharging their duty, your committee deemed it important to get the views of persons whose experience entitle them to consideration, and with this view a circular was issued to the members of the association.

To this circular only nine replies have been received from master mechanics.

ENGINE TRUCK WHEELS.

In engine trucks four use nothing but cast-iron wheels; in addition to cast-iron wheels four have in use cast-wheel centers with steel tires (350 wheels reported); three have in use cast wheels with steel faces (238 wheels reported); and one has in use solid steel wheels (number not given); those using cast wheels only have no data for comparison. One member using steel-tired wheels thinks the difference in cost small, but considers the steel-tired wheel safer. Another member considers the steel-tired wheel as four to one of cast iron. Another thinks the first cost of the steel-tired wheel against it in comparison with iron. Five prefer spoke wheels and four double-plate, the former giving as a reason that they allow a better inspection of the truck and its parts, and afford better access in oiling, while those preferring the latter think the spoke-wheels fan up the dust more and cause the brasses to wear faster.

Your committee have reports of three steel-faced wheels and seven of cast-iron, broken in the tread, although no damage to engines is reported.

DRIVING WHEELS.

Of those replying to our circular, four prefer hollow spoke hub and rim, one solid spoke and rim, and two solid spoke and hub and hollow rim; two have both kinds in use and both do well, therefore have no choice. Your committee have reports of nine broken wheels, all of hollow spokes.

TENDER WHEELS.

In tender trucks, six use nothing but cast iron wheels. In addition to cast-iron wheels, three use cast-iron centres with steel tires (292 wheels reported), two have in use cast wheels with steel faces (116 wheels reported), one has in use Bochum cast steel (number not given). Of those using steel-tired wheels under tenders, one prefers cast iron, one prefers steel-tired, and one prefers steel-faced wheels. Thirteen wheels are reported cracked and broken, all of cast iron. No damage reported, as they broke in the thread and flange.

TRUCK AXLES.

From replies to our circular, we learn the desire of members is to increase the size of journals. Seven are using journals, 4 1/2 diameter by 7 to 8 long, one uses 4 3/4 x 8, and one 5 x 9 (see sketch). For wheel seat the sizes vary from 4 1/4 to 4 3/4. Only two report as having steel, and recommend its use. No axles are reported broken.

DRIVING AXLES.

The dimensions of journals for driving axles reported are from 6 1/2 x 7 to 7 x 8, all use iron; two have steel in use. One uses it for crank axles, and another has thirty-four engines with steel axles, those using steel for driving axles prefer it for that purpose as giving better results than iron. We find from the replies that a majority use a parallel axle, while one recommends to enlarge the axle in the middle, especially for back axles, thereby making it more rigid.

Four back and two front axles are reported broken, four of which had been in service for ten years, and broke close to the hub.

TENDER AXLES.

From replies to our circular we learn that the desire is to increase the sizes of tender axle journals rather than diminish them. Three are using the Master Car-Builders' standard while the others are using journals from 3 1/4 x 7 to 3 3/4 x 6 1/4, all are using iron; one is using steel under three tenders. Two of those who have used steel prefer it for tender axles. Four iron axles are reported as broken, one at the hub of wheels and two at the journal.

The following is given by Mr. W. O. Hewitt, of the Toledo, Peoria & Warsaw Railway, showing the advantage of the Master Car-Builders' standard axle over the smaller journal: One 2,400 gallon tank with Master Car-Builders' axles ran 73,650 miles and cost for lubrication and waste \$2.27, and another 2,400 gallon tank with axles having 3 1/4 x 5 1/2 journals ran 74,730 miles, and cost for lubrication and waste \$7.27.

Your committee, believing that all the members are more or less familiar with the mileage made by cast-iron wheels, the following is given by Mr. George Richards, of the Boston & Providence Railroad, showing the mileage made by steel-faced and steel-tired wheels, etc.:

Four Bochum cast-steel wheels, under a heavy tender, ran 142,260 miles, and were in good condition. They had not been turned, and the wheel was heavy enough on the tread for three turnings.

A pair of paper wheels, under a light tender, making many stops, ran 125,941 miles, and were in a fair condition.

A pair of cast-iron wheels, run as mates to the paper wheels, made 91,062 miles, and were worn out.

A pair of steel-faced wheels, in heavy engine-truck, made 50,123 miles on the first run, and a total of 121,929 miles, and were condemned.

Another pair of steel-faced wheels, in heavy engine truck, ran 47,084 miles after first turning, and were condemned. Two pairs of steel-faced wheels, in heavy engine truck, made 79,905 miles first run, and 129,587 miles to date, and were in good condition.

Another pair of steel-faced wheels, in heavy engine truck, made 71,852 miles the first run, and 41,266 miles the second run; total, 113,118 miles, and were condemned.

Another pair of steel-faced wheels, under heavy tender, made only 31,372 miles the first run.

One pair of steel-faced wheels, in engine truck, made 38,932 miles first run.

One pair of steel-faced wheels, in engine truck, made 64,750 miles first run.

Your committee concur in the report of last year's committee with regard to the dimensions of engine and tender truck axles and of driving axles except the shoulder at the wheel seat.

In addition to the circulars sent to master mechanics, circulars were sent to eight locomotive builders and others. Two replies were received from the above. One builder has equipped 247 engines with cast-iron wheels in engine truck, 28 engines with cast wheels and steel tires, and 23 engines with cast wheels and steel faces; 1 engine with paper wheels. They have equipped 264 tenders with cast iron wheels, and 13 tenders with cast centres and steel tires.

They have equipped 228 engines with iron truck axles, 70 engines with steel truck axles, 412 engines with iron driving axles, 46 engines with steel driving axles, 230 tenders with iron axles, 47 tenders with steel axles.

The replies to this circular show that steel is being used for axles by a good many. All of which is respectfully submitted by

Yours respectfully,

ROBERT KING,
Master Mechanic Western Railroad of Alabama.
WILLIAM RUSHTON,
Master Mechanic Atlanta & West Point Railroad.
JAMES MAGLENN,
Master Mechanic Carolina Central Railroad.

MASTER MECHANICS' ASSOCIATION.

Twelfth Annual Convention.

The twelfth annual convention of the Master Mechanics' Association met at the Grand Hotel, in Cincinnati, May 13. President Chapman called the meeting to order, and, after prayer by Rev. D. F. Harris, an address of welcome was delivered by Col. L. M. Dayton.

The minutes of the last convention were then accepted as printed.

The roll being called, the following members answered to their names: H. Anderson, Chicago; H. G. Brooks, Brooks Locomotive Works; J. D. Barnett, Grand Trunk; John Black, Dayton & Michican; N. E. Chapman, Cleveland & Pittsburgh; H. L. Cooper, Indianapolis, Bloomington & Western; Charles H. Cory, Central, of Iowa; G. F. Conn, Mineral Range; J. F. Devine, Wilmington & Weldon; Henry H. Elliott, East St. Louis; James Eckford, Cincinnati, Hamilton & Dayton; J. H. Flynn, Western & Atlantic; Wm. Fuller, Atlantic & Great Western; W. A. Foster, Fitchburg, Vermont & Massachusetts Division; Charles Graham, Delaware, Lackawanna & Western, Bloomsburg Division; S. J. Hayes, Illinois Central; W. O. Hewitt, Toledo, Peoria & Warsaw; Jacob Johann, Wabash, Western Division; F. G. Kaufholz, Cleveland, Columbus, Cincinnati & Indianapolis; Robert King, Western, of Alabama; John Minshall, New York & Oswego Midland; J. McKenna, Indianapolis, Peru & Chicago; John McVay, Alabama Great Southern; John Orton, Canada Southern; G. H. Prescott, Pittsburgh, Cincinnati & St. Louis; George Richards, Boston & Providence; G. W. Reynolds, Old Colony, Northern Division; J. H. Setchel, Little Miami; James Sedgley, Lake Shore & Michigan Southern; H. W. Sprague, H. K. Porter & Co.; L. B. Salisbury, St. Louis & Southeastern; W. H. Selby, St. Louis, Kansas City & Northern; G. B. Simonds, Hannibal & St. Joseph; John Swift, Schenectady Locomotive Works; C. H. Tull, Vicksburg, Shreveport & Texas; W. F. Turrell, Cleveland, Tuscarawas Valley & Wheeling; Thomas Walsh, Louisville & Nashville, Memphis Division; B. Warren, St. Louis, Alton & Terre Haute; Reuben Wells, Jeffersonville, Madisonville & Indianapolis; J. E. Wiggins, Houston, East & West Texas; J. L. White, Evansville & Terre Haute; Philip White, Cleveland & Pittsburgh; J. O. D. Lilly, Indianapolis.

The following new members then signed their names: John Cook, Georgia Railroad; James T. Gardner, Concord Railroad; R. H. Briggs, Mobile & Ohio; B. J. Gregg, Cincinnati, Sandusky & Cleveland; Thomas Roberts, Marietta, Pittsburgh & Cleveland; John Bissler, Thomas Price, John Thumser, Ohio & Mississippi.

The President read his annual address, as follows:

"GENTLEMEN: Again am I permitted to greet you in assembling upon this, our twelfth annual meeting. At Richmond last year it was decided to meet here, in the famous Queen City of the great West, but more latterly known as the Paris of America, with its Proboscio Fountain, its beautiful Eden Park its famous Zoological Gardens, its world-renowned Academy of Music and Theodore Thomas, its inclined-plane railways, and last, but by no means least, its Cincinnati Southern Railway.

"We meet under the same pleasant general order of things which has prevailed throughout the country at each and every one of our meetings for the past eight years.

"In one respect the outlook is more pleasant than heretofore; the continuance of prosperity is even more assured now than it was one year ago.

"Resumption has proved, so far, a success, and if there has been no sudden increase of prosperity there has been none of privation or poverty, but instead there has been, I may say, a gradual and steady increase or revival of all branches of business, which bids fair to be as permanent as it has been steady.

"Our own society seems to share in the general prosperity, and if we have gained a few members, we have lost but few.

"For a statement of the financial condition of the Association, I refer you to the very able and satisfactory report of your Secretary. For the first time in the history of the Association, we find ourselves at the annual meeting free from debt, with a balance in the treasury.

"The interest in our meetings seems to be fully sustained. We are reaping some benefit from our organization, I think, in the carrying out of its fundamental principle—viz., railway economy; but although something has been done, yet there is still room for improvement, not perhaps in reducing wages, but in the improved methods of working and using our machinery.

"My friends, economy must be the watchword for the next few years in operating the railroads of this country if we would have lasting prosperity.

"Who can do more than the master mechanics toward educating the employes in their department to live cheaply, or at least within their earnings, which is the first lesson, and with many a hard one to learn.

"We can also do much toward reducing the expenses of our departments by close and careful application. There is, however, a minimum or limit in that direction, beyond which it is not economy or safe to go.

"We seem to be upon the eve of another railroad war upon rates, which would appear to be a suicidal policy, as the volume of business is not increased to any appreciable extent by such reduction in rates, neither is the producer or consumer benefited thereby. I am of opinion that if a fair, reasonable compensation could be fixed upon and adhered to, letting the business seek its own legitimate channel for transportation, the railroads as well as the country generally would be greatly benefited.

"It has been my pleasure to be present at each of the gatherings of this Association since the first formation of the Association in 1868 at which time, for some unexplained reason, I was selected to fill the office of First Vice-President, which office I held until the meeting in St. Louis, when, in the absence of your President, Mr. Britton, I performed his duties to the best of my ability.

"It was your pleasure at that, as at the succeeding meeting, to do me the honor of electing me to the office of President, for which mark of confidence I am deeply grateful, but having held office for so long a time in this Association I think it time for a change.

"Your committees are entitled to commendation for the able and efficient manner in which their reports were presented at our last meeting.

"I am informed by our Secretary that one of our members has gone before to that bourne from whence no traveler returns. I refer to J. B. Morse, late of the Eastern Division of the Wabash Railway.

"I trust suitable action may be taken by this Association in regard to the sad event.

"Thanking you for your indulgence, I now invite your attention to the next business in order, which is the reading of the report of your Secretary."

Secretary Setchel's report stated that at the last meeting the Association numbered 176 members; since then 12 have joined, five resigned, one died, and 20 have been dropped from the rolls, leaving 182. The cost of printing the last annual report was \$574.85, and 755 copies have been distributed to members, subscribing companies and others, or sold. There were also 105 copies of previous reports dis-

posed of, making 860 copies sent out during the year. There are now the following reports on hand: Five hundred and seventy-seven copies of the first and second, forty-two of the third, 281 of the fifth, twenty-four of the sixth, ninety-one of the seventh, 368 of the eighth, 316 of the ninth, 302 of the tenth, and 445 of the eleventh.

The distribution of the reports to railroads was by instruction of the Supervisory Committee, six copies being sent to each of the roads contributing to the printing fund last year, with a request for a renewal of their subscription, which has been very generally responded to.

The total receipts for the year were as follows:

Total amount contributed by companies	\$609.00
" " received by assessment	1,350.00
" " by initiation fees	12.00
" " by sale of reports	119.80
Amount from Railroad Gazette for use of MS. for two years, 1877 and 1878	100.00
Donation from W. W. Evans	10.00
Total amount received	\$2,200.80

The Boston fund, including a donation of \$59.05 from the Richmond Committee last year, now amounts to \$4,383.11. The report concludes as follows:

"At a called meeting of the trustees of the Boston fund, held May 13, 1879, at which Messrs. N. E. Chapman, of the Cleveland & Pittsburgh road; R. Wells, of the Jeffersonville, Madison & Indianapolis road; S. J. Hayes, of the Illinois Central road, and J. H. Setchel, of the Little Miami road, were present, a careful examination of the foregoing statement in regard to bonds and moneys belonging to the Boston fund was made and found to be correct. The trustees being advised that the interest on our bonds would cease in May and July, 1879, it was unanimously decided to exchange them for the 4 per cent. bonds. Accordingly 3,700 4 per cent. interest-bearing bonds were purchased, leaving a balance on hand unapplied at this date of \$5.31.

"I have given a full and complete history of the Boston fund for the benefit of new members and those who may be particularly interested in looking after the financial condition of the Association.

"The Secretary is in receipt of several mechanical and scientific periodicals from Europe and this country, which are the property of the Association, and we are also the owners of a very fine dynamometer, presented by Thos. Prosser & Sons, of New York, which was duly stated in my report following its presentation."

The Treasurer reported his receipts and payments as follows:

Balance, May 16, 1878	\$789.25
Receipts	2,200.80
Total	\$2,990.05
Disbursements, as per vouchers	2,453.33
Balance, May 13, 1879	\$536.72

The following were appointed a committee to audit the reports, and to report the amount of assessments for next year: George Richards, Jacob Johann and J. D. Barnett. The assessment was afterward reported at \$5.

The following were appointed a Correspondence Committee: Messrs. James Sedgley, Wm. Fuller and J. F. Devine. The report of the Committee on Standard Axle (published last week) was then read. It was followed by a discussion.

Mr. Johann said that a standard axle, although it might not be the best, is better than no standard at all. He urged action in the matter. He objected to the multiplicity of dimensions of axles. He thought a standard could be introduced at moderate expense, if started right. He believed the majority report was right in its recommendation.

Mr. J. L. White said he had used 3½ by 6½ journals, but he had enlarged his journals to 3½ by 7, with good results. The weight to each square inch is lessened in proportion.

Mr. G. B. Simonds, favored a 3½ by 6 journal.

Mr. B. Warren said he had adopted a 3½ by 7 journal, standard length, and carried from 12 to 17 tons, without difficulty. The wheel seat was 4½, and he would be in favor of that size, as a larger size would entail a large expense. He did not think the standard axles should be shortened. He favored looking to a uniform axle.

Mr. John Orton favored a 7 by 3½ journal. He thought it would be a matter of courtesy for the association to compromise with the Master Car-Builders. He wanted an axle that would stand the roughest usage.

Mr. John Black favored the adoption of the Master Car Builders' standard.

Mr. J. E. Wiggins, was anxious to have the business settled.

Mr. H. N. Sprague thought that if an agreement as to length could be reached, the diameter would not make so much difference. Mr. Warren thought that the difference in diameter was of greater importance than Mr. Sprague imagined.

Further discussion was then postponed to the next day. The report of the Committee on Lubricants was then read, and was followed by a short discussion, general opinion being in favor of natural oils, and of tallow for cylinders.

The Committee on Correspondence reported an invitation from the Cincinnati, Hamilton & Dayton road to visit the Dayton Soldiers' Home. The request was received and filed to be taken up hereafter, and a recess was taken.

After recess the following gentlemen were chosen associate members and signed the constitution: J. W. Hill, of Cincinnati; Professor Charles A. Smith, of Washington University, St. Louis, and J. H. Raymond, Secretary of the Western Railroad Association.

J. Davis Barnett, J. F. Devine and J. Swift were appointed a committee on place for holding the next convention.

Messrs. John Orton, William Fuller, Jacob Johann, J. F. Devine and George Richards were appointed a committee to prepare a list of subjects for discussion at the next meeting.

James Sedgley, H. M. Sprague and W. D. Hewitt were appointed a Committee on General Resolutions, and Jacob Johann, J. M. Boon and J. H. Raymond were named as a committee to prepare suitable resolutions on the death of J. D. Morse.

The Association then adjourned until the next day. In the evening the members visited the Grand Opera House by invitation.

SECOND DAY'S PROCEEDINGS.

At the opening of the meeting a letter was read tendering members the privilege of the Chamber of Commerce, which was appropriately acknowledged.

The report of the Committee on Wheels and Axles was then read. It is published elsewhere.

The discussion of the question of adopting standard car and tender axles was resumed.

Mr. Johann favored the adoption of the Master Car Builders' axle.

Mr. Sedgley thought it would trouble any one to determine the standard of the Master Car Builders to-day.

Mr. Boon objected to the size of the journal of the Master Car Builders, but did not object to a large journal. He thought the cost of changing would be too heavy. His idea was to take an axle with a journal that could be worked in by all roads with less expense. He also objected to the weight of the Master Car Builders' axle.

Mr. Simonds said that he was not in favor of a 3½ by 6-inch journal. His preference would be for not less than 3½ journal in diameter, and would go up to 7 inches in length.

Mr. Johann said the only impossible thing about the change was that no one would start to make the change. If a start was once made it would be surprising how soon a standard could be reached. The difficulty in changing axles is not so great as pictured.

Mr. Johann moved to adopt the standard axle of the Master Car Builders.

Mr. Black moved to amend to make the axle 3½ instead of 3.

The amendment was lost.

Mr. Johann's motion prevailed by a vote of 38 to 9.

Messrs. George Richards, Jacob Johann and D. Barrett, the committee appointed to examine the reports of the Secretary and Treasurer, reported the same correct.

The Committee on Next Place of Meeting reported, submitting New York and Cleveland to choose from.

The report of the Committee on the Best Material, Form and Proportions of Locomotive Boilers was then submitted. It was very long, and its reading occupied the rest of the session.

The afternoon was spent by members in visiting the Zoological Garden, Music Hall and other places of interest in and about the city under charge of the Committee.

THIRD DAY'S SESSION.

The first question that came up for discussion was the best form and material for locomotive wheels and axles.

Mr. Hayes spoke of the relative merits of the different wheels.

Mr. Johann said he had telegraphed to Mr. Forney that the standard wheel had been adopted, and had received a reply from him asking if the committee could prepare a drawing. President Chapman said the chairman, Mr. Sedgley, would do so.

Mr. Hayes said that he regretted that the committee did not figure the cost per mile for wheel mileage.

Mr. King replied, giving figures and estimates.

Mr. Hayes said the cost of paper wheels was nine cents per 1,000 miles. The cost of the chilled wheels about seven cents.

Mr. Johann said that different roads figured the cost in different ways. He favored the establishment of a basis of calculation, so that the difference in cost will be solely on the merits of the wheel.

Mr. Sprague suggested that the interest on the cost of the wheels should be taken into consideration.

Mr. Hayes said that he had been told that wheels were now being sold by the 1,000 miles. In reply to the question from Mr. Sprague he stated that wheels he used cost between \$8 and \$9.

On motion of Mr. Sprague, the discussion here closed.

The next subject for discussion was the report of the Committee on the Material and Construction of Locomotive Boilers. Mr. Wells, Chairman of the committee, said in some localities iron did not give as good satisfaction as steel for shell. In other cases the crown sheet had to be varied.

Mr. Sprague asked if any member present was using Bessemer steel.

Mr. Sedgley replied that he had used it to some extent.

Mr. Sprague thought it would be liable to laminate.

Mr. Hayes said he had formerly recommended steel for nearly all purposes, but he now doubted the advisability of using it in the shell.

As to the construction of the boiler, Mr. Wells said that the committee favored corrugating the fire-box sheet, believing that expansion and contraction would not then injure the material.

Mr. Sedgley said that he had adopted the practice of corrugation, and favored it. He said he saw no reason for abandoning the use of steel.

Mr. Young favored using a low grade of steel. He said he found that fine steel had a tendency to crack.

Mr. Sedgley said he was using a high grade of steel, and had no trouble. In reference to corrugated sheets, Mr. Graham said he had used them for nine years. He corrugated about the thickness of the iron beyond the centre line.

Mr. Hayes said he thought that all would not have the same experience with the same material, on account of the different qualities of coal used. He thought that with poor coal the low grade of steel gives the best satisfaction.

Mr. Woodcock had used corrugated sheets for a number of years with excellent results.

The delegates went into the discussion of the corrugated boiler question with considerable interest. It occupied the greater part of the morning session.

A brief discussion concerning the form and proportion of boilers and the use of domes followed.

The question, how to obtain the greatest amount of steam, occupied the attention of the members for some time.

Mr. Wells said that a comparison between English and American boilers showed that those having the largest amount of heating surface showed the best results.

Mr. J. H. Raymond, Secretary of the Western Railroad Association, was introduced, and addressed the meeting. He said that some plan should be devised for determining which of thousands of patents are valuable, and he wanted a system adopted by which the matter could be determined as soon as possible. In the course of his remarks Mr. Raymond said that there were 2,000 patents on couplers alone.

An invitation to a complimentary concert was then received and accepted.

The report of the Committee on Locomotive Tests was then read, as follows:

To the American Railway Master Mechanics' Association: GENTLEMEN: Your committee appointed to report on the subject of Performance of Locomotives would say that on account of the very few replies received to their circular, they have not been able to make up a report, but think the subject is worthy of still further investigation. Your committee desires to present to the association a report of a series of tests, made and furnished by our fellow-member, J. E. Martin, Master Mechanic of the Chilian & Talcahuano Railway of Chili, South America, on the exhaust nozzle, being a continuation of our report presented last year at Richmond, Va., on local tests. The above is accompanied with diagram, indicator cards, etc., and are the actual results of experiments on tests carefully made. Your committee would recommend that they be printed in the next annual report.

Respectfully submitted, Wm. Woodcock,

M. C. R. R. of New Jersey.

S. A. HODGMAN,

M. M. P. W. and B. R. R.

The report was adopted, and on motion of Mr. Hayes, the committee was continued for another year.

The next business in order being the election of officers, the old officers were all reelected for the ensuing year. A recess was then taken.

After recess, a short session was held, at which the routine business was finished up and the usual resolutions passed.

Most of the members attended the concert in the evening, and a large number joined in the excursion over the Cincinnati Southern to the Kentucky River Bridge on the following day.



Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMN. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

RAILROAD EARNINGS AND PROFITS IN 1878.

It is extraordinarily difficult to obtain a general view of the condition of transportation business—the earnings and profits no less than the traffic—in this country for any given time. It is not alone that comparatively few roads make monthly reports of earnings and still fewer monthly reports of expenses. Nearly all make yearly reports in some form or other; but as the fiscal years for which they report end with nearly every month in the calendar, we cannot with complete annual reports show the aggregate business, earnings or expenses for any one year. Indeed, we are so accustomed to having reports for different periods that scarcely any attempt is made at general comparisons.

But a very large number of the roads report for the calendar year; and, recognising the fact that reports from a large proportion of the roads may give some clew to the general tendency of business, though they cannot set it forth exactly, we have collected the figures for gross and net earnings for the companies that have, down to this time, reported for the year 1878, and present them, with the gross and net earnings per mile of road and the totals, in a table published this week.

In this table we have reports from 89 railroads, which worked in 1878 an aggregate of 29,835 miles of road, which is 2.2 per cent. more than their mileage in 1877. With these 29,835 miles of road the gross earnings were \$221,897,085, and the net earnings \$90,866,863. Compared with the previous year, there was an increase of 4.1 per cent. in gross, and of 7.2 per cent. in net earnings, the mileage being but 2.2 per cent. greater. The gross earnings per mile of road increased from \$7,804 to \$7,437, or 1.8 per cent., and the net earnings from \$2,887 to \$3,020, or 4.9 per cent.

The roads reporting had about three-eighths of the total mileage in operation in the United States in 1878. Evenly distributed this would give a close approximation to the average condition of the railroads of the country. It can hardly be said that it is evenly distributed over the country, however. The roads in New England and New York have to make reports to the state authorities for the fiscal year ending with September, and few of them make any other report. In our list we have in all this important district only 355 miles in Maine and 120 in New York, out of a total of 11,435. But some sections of the country are pretty fully represented. In the other states north of the Potomac and west of Ohio there are reports from 4,421 miles out of 8,632; for the states north of the Ohio and west of Pennsylvania as far as the Illinois line and Lake Michigan—that is, Ohio, the lower peninsula of Michigan and Indiana—there are reports from 6,880 miles out of a total of about 12,500; for Illinois, Wisconsin and the upper peninsula of Michigan they are given for 4,062 miles out of a total of 12,250; for the districts west of the Mississippi (except Texas) for 11,866 miles out of about 18,600; for the states south of the Potomac and the Ohio, including Texas, with about 16,000 miles of road, there are reports from 2,131 miles. Thus the table represents about 51 per cent. of the mileage of the Eastern States west and south of New York; 56 per cent. of the mileage in the states intermediate between Pennsylvania and Illinois; 33 per cent. of the mileage of Illinois and Wisconsin; 64 per cent. of the mileage west of the Mississippi, and only 13 per cent. of the Southern mileage. The roads of New England and New York have much more than the average earnings per mile of road, and those west of it somewhat less (though perhaps not those which report); the Southern roads have the smallest of all. On the whole, the earnings per mile of the roads in the table are considerably higher than the average for the country. It is not for this purpose that it has much value, but rather as indicating the general course of traffic on the railroads of the country, which we think it can be assumed to do for those in the territory west of New York and north of the Potomac and the Ohio.

An increase of nearly 5 per cent. in the net earnings per mile of road is certainly a material improvement, the more so because it was made at a time when additions to capital were very small, and it is doubtful if the average per mile of the stocks and debts was as great in 1878 as in 1877. The average net earnings were equivalent to 5.78 per cent. on a capital of \$50,000 per mile in 1877, and to 6.06 per cent. in 1878.

The comparison, however, is made with a year of light earnings. The first seven months of 1877 were probably the most trying to American railroads of the whole period of depression since 1873. There was then light traffic and excessively low rates. There was unusually good business and much better rates than during the other five months, and these prevented the year from being altogether disastrous. We have frequently spoken of the year ending with July, 1877, as the "worst year for earnings." There are but two or three reports for precisely that year; but there was a great improvement in traffic and some improvement in rates after July, and the results reported in some state reports for the year ending with June is further confirmed by a table of earnings for 64 companies, with 11,391 miles of road (mostly Eastern) which was published Feb. 8, 1878 (page 70). This showed a decrease of 6.8 per cent. in gross and 5.2 in net earnings, when compared with the previous year.

In 1878 there was a heavy freight traffic throughout the year, usually at very low rates, and generally the lightest passenger traffic since the war. While the earnings and profits were so much greater than in the previous year, the improvement over 1876 cannot have been great. The improvement, however, coupled with the great harvests of 1878 which assured a large traffic for at least half of 1879, has had a great effect in restoring confidence. It proved that the tendency of railroad profits was not inevitably and uninterruptedly downward, and led most investors to believe that the worst was passed and that what had proved good through so many trials could be safely depended upon in the future—a conclusion which in most cases is probably sound, but which in some cases may very easily turn out false this very year, if so large a proportion of the business as at present continues to be carried at bare cost or less than cost. Certainly the conclusion that seems to have been made by many, that as a stock which has continued to pay dividends throughout the bad times is worth more now because of having endured adverse circumstances so well, so stocks of companies which have never paid dividends, and perhaps have not even earned the interest on their bonds recently, are greatly improved in value—this conclusion, we

say, is in no respect justified. There has been and is no great general improvement in railroad profits, and there is not the least reason to believe that lines which depend chiefly on through traffic will make greater profits this year than last, and at present there is great danger that they will not do so well. The lines next west of the trunk lines suffer especially under existing circumstances, and those with least local traffic, which are usually those which have few large towns but many competing points on their roads, fare worst of all. Some of these certainly cannot long endure the present condition of things; yet their stocks have in some cases advanced more than 100 per cent. since the beginning of the year. Roads which have little or no business of the kind done at trunk-line rates may greatly profit by the heavy traffic, and if we have a good harvest next summer will certainly be in a very good position, but it is not these roads whose stock has risen most, but precisely those which have a great preponderance of east-bound traffic carried at trunk-line rates—that is, just now, at 0.3 cent. per ton per mile, or even less, leaving absolutely no margin of profit to apply to interest on bonds and dividends on stock.

THE STANDARD AXLE AND THE REASONS FOR ADOPTING IT.

It was announced in the *Railroad Gazette* of last week that the Master Mechanics' Association had passed a resolution recommending the adoption of the the Master Car-Builders' standard axle. The vote was a decisive one of 38 for to 9 against recommending it. This places the recommendation beyond further dispute, and puts the two associations of car-builders and master mechanics virtually in accord on this important matter. The car-builders will take the subject up again at their meeting next month, and they will no doubt confirm their previous action. As a significant sequel to the action of the Master Mechanics' Association, Mr. Vanderbilt has just contracted for 2,200 freight cars, all of which, it is specified, shall have the standard axles and continuous draw-bars. Of these cars 700 are for the Lake Shore & Michigan Southern, 100 for the Michigan Central, and 1,500 for the New York Central & Hudson River. It may be mentioned incidentally here that of these 600 are to be four-wheeled box cars of the new pattern designed by Mr. Garey, which he has recently put into use.

Of the advantages which will result from the introduction of a common standard for car-axes, it seems hardly necessary to speak here. The reasons for such action are apparent if we realize in some way the diversity which now exists. To show how irrational the present condition of things is, the accompanying table has been prepared giving the principal

NAME OF ROAD.	Kind of Axle.	Diameter of Journal.		Length of Journal.		Diameter of Wheel-seat.		Length from centre to end of journal.		Weight, lbs.
		In.	In.	In.	In.	In.	In.	Lbs.		
Bos. & Albany, East Div.	Tender	3½	5½	4½	5	1½		307		
Bos. & Albany, West Div.	"	3½	5½	4½	6	¾		345		
Bos. & Albany, N. Y. Cen. & Hud. River.	Pass. and Ft. { Pass. Freight } and Tender	*M.	C.	B.	Stand.			340		
		"	"	"	"	"		335		
L. S. & Mich. Southern.	Tender	3½	7	4½	6	3		325		
L. S. & Mich. Southern.	Passenger	"	"	4½	"	"		320		
L. S. & Mich. Southern.	Freight	3½	5½	4½	6	1½		315		
Canada South.	Tender	3½	6	4½	6	2		284		
"	Ft. and Pass.	3½	7	4½	6	3		321		
Wabash.	Tender and Pass.	*M.	C.	B.	Stand.			360		
Mich. Central.	Tender	4	7½	5	6	2½		402½		
"	Passenger	3½	7	4½	6	5		350		
"	Freight	*M.	C.	B.	Stand.			394		
Chi. & North-western.	Tender	3½	5½	4½	5	11				
Chi. & North-western.	Pass. and Ft.	3½	6	4½	6	2½		311		
Chi. Rock Is. & Pacific.	Tender	3½	6½	4	6	2¾		275		
Chi. Rock Is. & Pacific.	Freight	3½	6	4½	5-16	3				
Chi. Rock Is. & Pacific.	Passenger	*M.	C.	B.	Stand.					
Chi. & Alton.	Tender	3½	5½	4½	6	1½		360		
"	Freight	3½	6	4½	6	2		320		
"	Passenger	3½	7	4½	6	2		320		
Chicago, Bur. & Quincy.	Pass. Freight and Tender	3½	6	4½	6	1½		350		
Ill. Central.	"	3½	6	4½	6	2				
Chi., Milwaukee & St. Paul.	Tender	3½	7	4½	6	2½		313½		
Union Pacific.	"	4	7¾	4½	6	3½		330		
"	Passenger	3½	7¾	4½	6	4½		325		
"	Freight	3½	6	4½	5	1½		290		
*Master Car-Builders' Standard Axle.		3 3/4	7	4 7/8	6	3		335		

† These axles have no collar or outer end.

dimensions of the standard axles which are now put under new cars and tenders in the system of roads which connect directly with the New York Central line. It must be remembered, too, that the dimensions given are those of the standard axles alone,

which are used on those lines, and not of the great variety of other axles still in use which are not now regarded as standards. If these had been added, the table would probably be from five to ten times as large. By looking over the table a great many curious differences will be observed. Thus, take the tender axles used on the two divisions of the Boston & Albany road. The journal of the one is $3\frac{1}{2}$ in. in diameter and the other $3\frac{1}{4}$. The length from centre to centre of journals is 5 ft. 11 $\frac{1}{2}$ in. on one and on the other 6 ft. $\frac{1}{4}$ in. There is doubtless a good reason for this difference, from the fact that the line was formed not a great many years ago by the consolidation of two independent roads, the machinery departments of which are still under the management of separate heads. Still there can hardly be any good reason for perpetuating such a slight discrepancy, which renders it impossible to interchange the axles of the one of tenders with those of the other. On the New York Central road all new passenger, freight and tender axles are now made of the Master Car-Builders' standard. On the Lake Shore line the tender and passenger axles are alike, but the freight axle is different. On the Canada Southern the journals of the tender axles are $3\frac{3}{4} \times 6$, whereas the car axles are $3\frac{1}{2} \times 7$, and the distance from centre to centre of journals differs by one inch. We have no report of the freight axles used on the Wabash road, but tender and passenger axles are now all made of the Master Car-Builders' standard dimensions. On the Michigan Central road a curious anomaly exists. The tender axles, it will be seen, have $4 \times 7\frac{1}{2}$ -in. journals, the largest in use anywhere, excepting, we believe, on the Louisville & Nashville road. The freight and passenger journals are both of the Master Car-Builders' standard, $3\frac{3}{4} \times 7$ in., but the length of the passenger axle is 6 ft. 5 in., instead of 6 ft. 3 in., which is the standard. Probably this length was adopted to suit the dimensions of existing rolling stock. The freight axles are made to the regular standard. On the Chicago & Northwestern road the tender axles are $3\frac{1}{2} \times 5\frac{1}{2}$ and the car axles $3\frac{1}{2} \times 6$, with a difference of $\frac{1}{4}$ in. in the length of the axles, so as to make it impossible to interchange them. A similar difference exists on the Chicago, Rock Island & Pacific road. Why there should be a difference of half an inch in the length of journals and a quarter inch in that of the axle is not plain, yet it is enough to make it difficult to interchange the axles. On the Chicago & Alton line the same diameter of journal is used for all three classes of axles, but the lengths are respectively 5 $\frac{1}{2}$, 6 and 7 in., and, still more remarkable, there is a difference of $\frac{1}{4}$ in. in the distance from centre to centre of journals, a discrepancy which no doubt was the result of not having any standard drawings. On the Chicago, Burlington & Quincy and Illinois Central roads all the classes of axles are alike, with a difference of $\frac{1}{4}$ in. between them in the diameters of journals, and $\frac{1}{2}$ in. in the length of axles. Of the Chicago, Milwaukee & St. Paul road we have a report of the tender axle only. On the Union Pacific the axles for tenders and each class of cars is different.

The question then naturally suggests itself, what possible good can be accomplished by this diversity? It is of course not difficult to account for it. Each one of these roads has undergone a process of development, independent of the others. It is but natural that this should result in diversity; but on a system of roads like that to which all these lines belong, where a great proportion of the traffic is conducted by the interchange of cars, so that on each line the cars of all the other lines must be repaired, it would seem to be of the utmost importance that there should be uniformity. If we classify the different journals by their size, it will be seen how unreasonable the differences are. The journals given above are as follows:

$3\frac{1}{4} \times 5\frac{1}{2}$ in.	$3\frac{1}{2} \times 6$ in.	$3\frac{3}{4} \times 7$ in.
$3\frac{1}{4} \times 5\frac{1}{2}$ "	$3\frac{1}{2} \times 6\frac{1}{2}$ "	$3\frac{3}{4} \times 7$ "
$3\frac{1}{2} \times 6$ "	$3\frac{1}{2} \times 7$ "	$3\frac{3}{4} \times 7$ "
$3\frac{1}{2} \times 6$ "	$3\frac{1}{2} \times 7$ "	$3\frac{3}{4} \times 7$ "
$3\frac{1}{2} \times 5\frac{1}{2}$ "	$3\frac{1}{2} \times 5\frac{1}{2}$ "	$3\frac{3}{4} \times 7\frac{1}{2}$ "
$3\frac{1}{2} \times 6$ "	$3\frac{1}{2} \times 6$ "	$4 \times 7\frac{1}{2}$ "
$3\frac{1}{2} \times 6$ "	$3\frac{1}{2} \times 7$ "	$4 \times 7\frac{1}{2}$ "
$3\frac{1}{2} \times 6$ "	$3\frac{1}{2} \times 7$ "	

It will be seen from this that there are 13 different sizes of journals, and consequently each one will require a separate kind of journal-bearing in case of a hot box or other cause making renewal necessary. No two of the axles, excepting the Master Car-Builders' standard, are exactly alike in the dimensions given. On many of the roads the axles of the dimensions given number by thousands. On the Illinois Central, for example, the whole equipment is supplied with axles of the standard given in the table, and doubtless on other roads a very large proportion of the cars and tenders are running on the size of axle reported. Now it would be manifestly absurd to expect that on such roads the axles now in use will be thrown away and new ones put into their places, and it would be much more absurd to expect, as some master

car-builders and master mechanics do, that uniformity will be attained by every one adopting what he is using. The only possible way by which uniformity can be reached is by the adoption of some one standard by mutual agreement. After years of discussion, with great opposition from many sources, such agreement has been attained by the only two associations which are likely to take the subject up, and the members of which certainly *should* be more competent than any other persons to form an intelligent opinion about it. There is no probability, and hardly a possibility, that any other body of railroad men will take up the matter and consider it, much less agree about it, so that the question of uniformity *now* resolves itself down to the question of adopting the Master Car-Builders' standard or not adopting it. In other words, the only practical way now open to secure uniformity is for railroad companies to act in accordance with the recommendations of the two associations referred to.

A serious obstacle which now stands in the way of introducing the standard axle is, that the persons in charge of the locomotive and car departments on different roads do not generally feel that they have the authority to make as great a change from their ordinary practice as the use of this axle implies. To get over this difficulty, if the superintendents or general managers of the different lines would simply issue an order that after its date all new and reconstructed cars and tenders must be supplied with the standard axle, the object aimed at would at once be placed in process of accomplishment.

When the subject comes up, those who have authority to decide about it are prone to consider the question, whether the standard axle which has been adopted is the best one that is possible. To this it may be answered at once that the *best* axle is not that which everybody or perhaps anybody thinks is the best; but it is the best that you can get the people who must decide the matter to agree upon.

A great deal of objection has been made to the weight and cost of the axle. We have therefore—when it was possible to do so—given the weights of the axles in the above table, from which comparisons can be made. An amusing story is told of a master mechanic not a thousand miles from—well, no matter where—who objected most strenuously to the master car-builders' standard axle because it was too big and heavy and expensive. On investigation, it was found that the axle he was then using was *heavier* than the standard axle, but its material was not distributed "where it would do the most good." By comparing the weights of the Master Car-Builders' standard, given in the table above, it will be seen that there is a wide difference. Thus, on the New York Central road it weighs 335, on the Boston & Albany 340, on the Wabash 360, and on the Michigan Central 394. It will be seen that the tender axle used on the Western Division of the Boston & Albany Railroad with a $3\frac{1}{4} \times 5\frac{1}{2}$ -in. journal weighs 345 lbs. or 10 lbs. more, and the Lake Shore tender axle with $3\frac{1}{2} \times 7$ -in. journal weighs 325 lbs., or 10 lbs. less than the New York Central axle. The Chicago & Northwestern car axle, with $3\frac{1}{2} \times 6$ -in. journal, weighs 311 lbs., and the Chicago, Burlington & Quincy axles weigh 350 lbs. The Pennsylvania freight axle weighs 287 lbs., and the passenger axle 317. The difference in weight is therefore so small as hardly to be worth considering.

In the minority report on this subject made to the recent convention of master mechanics, it was shown that the ultimate transverse strength of $3\frac{1}{4} \times 6$ -in. journals, which were considered the best proportions twenty years ago for cars weighing, loaded, 37,500 lbs., was about *fourteen* times that of its load. With the present cars, which weigh 50,000 lbs. loaded, a $3\frac{1}{4} \times 7$ -in. journal has an ultimate strength of somewhat *less than fourteen* times the load, showing that in proportion to the loads carried a journal of the latter size now is no stronger than the $3\frac{1}{4} \times 6$ -in. journal was twenty years ago. The weight per square inch of bearing surface on the journal was, in the old car, 208 lbs.; in the present ones it is 212 lbs., thus showing that either the size of journal named was too large then or that the standard is not too large now for the weights carried.

There is one method of arriving at the size of car axles that to some classes of railroad men appears to be eminently practical and safe, but is very apt to be exceedingly misleading. Whenever the subject of the size of journal has been discussed, there have been persons who objected to an increase because, they say, "we have journals which have been worn down to two inches diameter, and they have not broken." A stereotyped remark is: "We never have broken journals on our road." But a little vigorous questioning usually brings out the qualifying clause of "hardly ever." The testimony is therefore like that of the man

accused of stealing an axe, who tried to prove his innocence by a multitude of witnesses who didn't see him steal it. Intelligent railroad men will take average practice as a quick method of determining the factor of safety of axles who would regard such a process as the height of absurdity if employed to determine the factor of safety which should be used for bridges. Average practice is not a safe guide for proportioning axles any more than it would be for proportioning an iron bridge.

Of the economy in the cost of axles, journal bearings, etc., if a universal standard were used, it is hardly necessary to speak. They would then become staple articles of merchandise which would be produced in large quantities during dull times with the assurance of having a market in the future.

This is impossible now because manufacturers are not certain of a demand for any special size they may make. There therefore seems to be every reason for adopting the Master Car-Builders' standard axle, and there is none for supposing that any other will, within a reasonable time, have sufficient authority to induce railroad companies to use it. If, therefore, we are to have a standard car and tender axle it must be the Master Car-Builders'.

New York Grain Receipts.

The receipts of grain, including flour reduced to grain, at New York for the first four months of the year have been by each route, in bushels, for the past five years, as follows:

	1875.	1876.	1877.	1878.	1 79.
N. Y. Central.....	7,427,238	8,827,705	6,453,361	18,123,191	16,884,517
Erie.....	5,599,722	5,410,308	3,067,380	7,024,550	10,298,006
Penn.....	3,174,682	2,310,277	2,085,829	4,444,259	6,950,487
Other roads.....	326,203	370,630	112,880	466,997	601,489
By water.....	800,354	2,054,491	1,947,354	2,131,872	1,152,244
Total.....	17,328,000	18,973,480	15,190,810	32,790,869	35,875,833

This year the total receipts are $9\frac{1}{2}$ per cent. greater than last year, 136 per cent. greater than in 1877, 89 per cent. greater than in 1876, and 107 per cent. greater than in 1875. By every route except water there were larger receipts this year than ever before. There were no deliveries by canal this year, as there often has been in April—as there was especially last year.

The changes in the relative rank of the routes as carriers of grain to New York are shown by the following, giving the percentage of the total delivered by each route each year for the four months:

	1875.	1876.	1877.	1878.	1879.
N. Y. Central.....	42.9	46.5	42.5	55.3	47.0
Erie.....	32.3	28.5	20.3	23.3	28.7
Pennsylvania.....	18.3	12.2	17.7	13.5	19.4
Other roads.....	1.9	2.0	0.7	1.4	1.7
By water.....	4.6	10.8	12.8	6.5	3.2
Total.....	100.0	100.0	100.0	100.0	100.0

The New York Central & Hudson River has for many years led the list of rail grain-carriers to New York, and though this year it has delivered a smaller proportion and quantity than last year, both quantity and proportion are larger than in any year previous to 1878. The New York, Lake Erie & Western delivered a much larger quantity than ever before, but a smaller proportion of the whole than in 1875. The Pennsylvania improved its position more than any other road. Putting aside the receipts by water, the percentage of the rail grain delivered at New York by each road has been:

	1875.	1876.	1877.	1878.	1879.
N. Y. Central.....	45.0	52.2	48.7	59.1	48.6
Erie.....	33.9	32.0	30.2	24.9	29.7
Pennsylvania.....	19.2	13.6	20.3	14.5	22.0
Other roads.....	1.9	2.2	0.8	1.5	1.7

This shows better the success which the several roads have had in competing with each other. The New York Central has a much smaller proportion of the whole of the rail grain than last year, and a somewhat smaller one than in 1876. Against the 10.5 per cent. which it has lost since last year, 5.5 per cent. has been gained by the Pennsylvania and 4.8 by the Erie. The January snow blockade favored the Pennsylvania as against the New York roads, but the Erie gained in spite of it. It suffered somewhat less from the blockade than the New York Central.

The variations in the traffic from month to month, which in a season of irregular rates like last winter have a special interest, are given below for the five months since navigation closed last fall:

	December.	January.	February.	March.	April.
N. Y. Central.....	3,492,546	2,530,742	4,192,787	5,331,821	4,809,168
Erie.....	1,905,111	1,507,382	2,751,678	2,753,801	3,285,335
Pennsylvania.....	1,915,688	1,709,394	2,338,217	1,554,498	1,357,378
Other roads.....	214,178	219,212	211,132	130,140	41,005
By water.....	806,028	171,726	306,003	214,892	300,653
Total.....	8,393,551	6,138,356	9,892,817	9,985,122	9,850,538

It is noticeable that in the three last months the total receipts have been nearly the same and very nearly 10,000,000 each month. The January snow blockade probably reduced that month's receipts by something like 2,500,000, of which, at the rate the business was divided for the season, the New York Central lost about 1,600,000 and the Erie 900,000 bushels. But it is doubtless true that the Pennsylvania deliv-

ered more in January than if the blockade had not existed, and that the total receipts after January were increased by the reduction in receipts that month.

Following out this table month by month, it appears that the New York Central had its largest business in March, and that the New York, Lake Erie & Western had very much the largest in April. The Pennsylvania delivered most in February and least in April. Recently it has been carrying larger quantities to Philadelphia than it did earlier in the year.

The percentage of the total delivered by each route each month since November has been:

	December.	January.	February.	March.	April.
N. Y. Central.....	41.6	41.2	42.4	53.3	48.8
Erie.....	22.7	24.5	27.8	27.6	33.3
Pennsylvania.....	22.8	37.9	23.6	15.6	13.8
Other roads.....	2.6	3.6	2.2	1.3	0.4
By water.....	10.3	2.8	4.0	2.1	3.7

Here we remark especially the steady increase made by the Erie, which, with a trifling exception, has advanced in position every month. None of its gains were made at the expense of the New York Central, however, until April. Then, while it, in comparison with March, gained 5.7 per cent., the Central lost 4.6 and the Pennsylvania 1.8 per cent.

The opening of navigation not only brings forward the most formidable competitor of the railroads for this traffic—the Erie Canal—but it also gives the railroads important new connections. All three of the great railroads that deliver at New York have propeller lines which ply between their lake termini (Buffalo and Erie) and the upper lakes, and these lines bring them an enormous quantity of grain during the summer—to some of them more than they get from all their rail connections at that season.

The Reading's New Leases.

The lease of two-thirds of a line between Philadelphia and New York by the Philadelphia & Reading Company, the greatest of coal producers and carriers, was certainly unlooked for. In many respects it is a rational movement. That is, it is easy to see why the Reading should desire a New York outlet under its own control. Three of the other great coal carriers have one, and the New York market is too important to be neglected by a corporation that has as much coal to sell as the Reading has. Of course it has not been shut out from this market. Not only has it steam colliers, but there are railroads which, though not controlled by the Reading, are always ready to carry its coal to New York for it if offered rates that leave any profit. Still, it is true that the control of a road is desirable. In the anthracite business the competition with rivals sometimes compels the mining and carriage of coal for considerable periods without regard to profit. This is done, of course, with a view to preserving or extending business for a future time when it will be profitable. But only those roads can afford to make sacrifices which are sure of the business thereafter, and it might not suit the Pennsylvania Railroad, for instance, to help fight the Reading's battles through a winter, when the traffic, after it had become profitable, might be turned over another road or sent by sea.

And there being a road to New York that will conveniently serve the Reading's purpose, there is no reason in the nature of things why the two should not be worked together to as good advantage at least as they had been worked separately before, and as the Reading traffic has heretofore gone by another route, there should be as much gain by it as the profit of this traffic amounts to, whatever it may be. If the Reading could get a road to New York for a rental no greater, or but little greater, than the yearly profits had been, it would seem to be a good bargain for it and not necessarily a bad bargain for the New York road.

But it has not done this. In the first place it has not got a railroad to New York, but only one to a connection with the Central Railroad of New Jersey, one of its chief competitors for the supply of the New York market, at a point 31 miles from New York. To put it into position to control absolutely its coal shipments by rail to New York a combination or permanent contract with the Central of New Jersey seems still necessary. In the next place, it does not get this part of a New York line at a price based on what it has earned heretofore, but at a much higher price. During the two years that the two leased roads have been completed, their aggregate net earnings have been: in 1877, \$629,092; in 1878, \$692,084. Now for the property which has made these yearly net earnings, the Reading binds itself to pay (besides whatever may represent the interest on a large floating debt and on nearly half a million of ground rents and mortgages) the sum of \$804,085 the first two years, \$923,647 the next two and \$983,209 forever thereafter. It agrees to pay 6, 7 and, finally 8 per cent. dividends on about \$6,000,-

000 of capital stock which has never earned any such dividends, while the profits of the larger and older of the roads have not shown any tendency to increase. Thus the net earnings of the North Pennsylvania and the Delaware & Bound Brook for several years past have been as follows, the North Pennsylvania's years ending with Oct. 31, and the other road's years with Dec. 31 of the years named:

North Penn. Bound Brook.		North Penn. Bound Brook.	
1872.....	\$804,100	1876.....	\$780,519
1873.....	545,000	1877.....	592,047
1874.....	504,738	1878.....	573,061
1875.....	512,102		119,023.

Thus the rental promised by the Reading can be justified only by prospects of increased profits hereafter—by a sudden increase. A large contribution of coal can be depended upon from the Reading, undoubtedly, if the Central of New Jersey agrees, but not much else. Further, the more central station of the Reading in the city of Philadelphia may considerably increase the passenger traffic between New York and Philadelphia—not that passing through Philadelphia. Should the Reading get running rights over the Junction Railroad in Philadelphia, then the Baltimore & Ohio might make its connections with New York by this route, which would give it a share of the Washington and Southern business, which would be of decided advantage so far as passengers are concerned, but not much for freight. But it does not follow that the Baltimore & Ohio will use this route if it can. The Pennsylvania, though earnest in opposing routes which may compete with it, is not foolish enough to refuse to work for a rival when it can make anything by so doing. If the new line has the way made clear for it to Baltimore and Washington, probably the Pennsylvania would not let it get the Baltimore & Ohio's business away from it at rates which would leave any profit to speak of.

Passenger traffic, we know, does not grow much; the increase of the new line must come chiefly from the old one. The chief dependence for an increase in the profits of the leased roads must be put on the coal traffic, and the profits on that fluctuate so greatly that it offers no safe basis for an estimate. The men best informed do not believe that there is any profit in the business at current rates. These rates, however, are extraordinarily low, and probably no one expects that they will continue. It would not be surprising if within a year the price at New York should be a dollar a ton higher. On the Reading's deliveries a very large part of the advance would go to it as miner and carrier. An advance, however, would not be affected or in any degree influenced by the control of the leased roads, and should be considered in respect to them only to the degree that it would affect the profits on the coal carried over it. Should the Reading send 2,000,000 tons a year over it, there might not be a dollar of profit on the carriage at half a cent a ton a mile, while at a cent a ton a mile there might be \$600,000 profit, and half that amount would justify the lease. It must be remembered that of the 119 miles leased the Reading's coal would use only 58 miles. While it is reasonable to expect in the future on the average a larger rate of profit than at present is had on coal freights, it is not likely that as much as half a cent a ton a mile will be made where there is no handling. Most lines between the East and West have to be satisfied with half as great a profit on the average freight, which is very much more valuable and somewhat more costly to carry than coal.

Whether the lease be good or bad for the Reading, it certainly appears good for the leased companies. It is not, however, so certainly good as might appear from its terms or as if the lessee was a stronger corporation. In these days the Reading cannot count upon a surplus from its own roads with which to meet any possible failure of the newly leased lines to pay their rentals. The guarantee of the Reading to pay 6 per cent. on Delaware & Bound Brook stock will not by itself make that stock worth par. But the lesser companies do not take any risks. If the Reading cannot pay the rental it promises, they will get their roads back, and have all they ever have had heretofore—whatever profits their roads may be able to earn.

Record of New Railroad Construction.

This number of the Railroad Gazette contains information of the laying of track on new railroads as follows:

Southern Pacific.—Extended from Maricopa Wells, Arizona, eastward to Casa Grande, 26 miles.

Denver, South Park & Pacific.—Extended from Webster, Col., to Kenosha Summit, 8 miles. It is of 3 ft. gauge.

Kansas City, Emporia & Southern.—The first track is laid from Emporia, Kan., south 5 miles.

Cincinnati Southern.—Track is laid from Boyce's Station, Tenn., north by east to Dayton, 30 miles.

This is a total of 69 miles of new railroad, making 562 miles thus far in 1879, against 312 miles reported for the same period in 1878, and 365 in 1877.

THE SOUTHWESTERN WAR has taken a peculiar phase, so far as west-bound traffic is concerned. While the Chicago roads have been complaining that the trunk-lines were favoring unduly the St. Louis roads on the shipments through from the seaboard to Missouri River points, the Chicago roads have been getting most of the business. It is utterly unimportant whether they get much or little just now, as the business will be divided on terms hitherto made, in the long run; and those that get more than their share now will get less hereafter, and then perhaps the rates will be better and the business worth something. But the St. Louis roads appear not to compete at all for the shipments from St. Louis westward—that is the Missouri Pacific and the St. Louis, Kansas City & Northern do not. They maintain a 25-cent rate, while the Chicago roads make a 10-cent rate from Chicago, and the Chicago & Alton an equally low rate from East St. Louis. The consequence has been that the shipments from St. Louis have gone almost exclusively by the Chicago & Alton, and at times this road has had more business than it could accommodate, and the other St. Louis roads have got business at their 25-cent rate in consequence. This would perhaps be the best policy for the latter if it could be extended to the whole traffic—east-bound as well as west-bound; but as the St. Louis roads compete actively for the east-bound business at 5 cents per 100 lbs., they have an abundance of empty cars to haul back, for which loads would seem to be desirable even at 10 cents per 100 lbs. The Chicago roads would have the advantage for the east-bound business if anything like tolerable rail rates were charged from St. Louis and Chicago to the East, for the grain would go preferably to the lake to get the low water rate; but with a rail rate of 8% to 10% cents per bushel for wheat from St. Louis to New York, and 7 to 8% to Baltimore, it is hardly worth while to incur elevator charges for the sake of water rates. When the freight once gets into a car it would better be sent right on to its destination. At present it costs as much to send a car-load of merchandise over the St. Louis bridge as to ship a car-load of grain from Kansas City to St. Louis, 280 miles; and the charge for five car-loads from East St. Louis to St. Louis, a little more than a mile, has been accepted for two car-loads from Chicago to New York, 912 miles. The war rates on the roads from Chicago and St. Louis to Missouri River points are only about as low the last regular rates made on east-bound traffic from the West to the seaboard, and are not so low as the present prevailing rates. They ought to be higher, of course, because there is not so much traffic to support the roads. There is not as yet the slightest sign of any lull in the contest, and it looks as if the Kansas traffic, which is of considerable importance to several roads, might be made wholly worthless for the next six months. Then the people who have been having their wheat carried from Kansas City to St. Louis at 3 cents a bushel will make a tremendous outcry if the roads attempt to establish the old rate of 9 or 12 cents. But at present the people and railroads of Kansas are likely to enjoy the war, though the latter may apprehend that it will not have a good effect on the disposition of the Kansas voters and legislators to have to contemplate daily for a long time the differences between the rates of the roads west and those east of Kansas City and the Missouri River. If, these unreasonable people will say, the roads carry wheat nearly 1,500 miles from Kansas City to New York for 12½ cents a bushel, it will be very generous of us to limit the roads in Kansas to 5 cents a bushel for 200 miles, and then proceed to starve their roads to death, or try to, because some one else has had a quarrel and carried freight for less than cost. As things are going, a grain farm might as well be in Kansas, 1,500 miles from the consumers, as in the Genesee or Shenandoah valley, 1,100 or 1,200 miles nearer. There is not much difference in the price of carriage.

EAST-BOUND RATES were probably never before so unsatisfactory. It is said that a contract has been made to carry 1,000,000 bushels of grain from Chicago to New York at 12½ cents per 100 lbs.—0.274 cent per ton per mile by the shortest route—and if this is true then probably most of the grain is going at that rate. This will pay for greasing the car wheels—if you use cheap grease. But we are used to low rates on grain and fourth-class freight, and though these are lower than have been made for any considerable business before, they are still not entirely surprising. But in addition the rates on live stock have gone to pieces in the most discouraging way. Now this is a business which has continued to be profitable nearly all the time while the east-bound freight was fought over and made not worth fighting for. It was divided through "eveners," and generally a 60-cent rate was had, of which the eveners got 7½ cents at first, and since last summer 5 cents. There was trouble last summer, which was settled in September; and most of the time since the first contract with the eveners was made, which was in April, 1875, the rates on live stock have been maintained at from 50 to 60 cents per 100 lbs., though for a great part of that time grain rates have been 20 cents or below. The great railroad war of 1876 did not disturb live-stock rates, and generally when the railroads have carried other business without profit they have had the consolation that the live stock was netting them something handsome. There has always been a feeling that the method of dividing the business, by paying a few leading cattle shippers \$10 or \$15 a car-load on the whole quantity shipped, was not fair to the rest of the shippers; but the railroad men have excused the plan by saying that it worked—that under it they have made two or three times as much profit as they were able to without it. But in spite of eveners, the rates have now been cut. Some time ago it was dis-

covered that some one had made a contract at a cut rate. A meeting of the Joint Executive Committee of the Eastern and Western roads was held in Cleveland, May 8, to consider the condition of the traffic. It having been shown that contracts existed at reduced rates, it was decided to reduce the regular rates (60 cents from Chicago and 65 cents per 100 lbs. from East St. Louis to New York) to 35 and 37½ cents respectively, which is understood to be the rate of contracts. This was bad enough, but as soon as this reduced rate had been made the several roads seem to have begun to take cattle for whatever they could get, and it can hardly be said that there are any rates now. Through the new Pittsburgh & Lake Erie the Lake Shore has begun to compete for shipments to Pittsburgh, which is an important live-stock point, and live stock seems to have gone to join the other east-bound freight as leading a occupation but not a support of the railroads. Now the live-stock earnings have been no trifle. In 1878 from Chicago alone about 43,000 car-loads of cattle and 58,000 of hogs were shipped. At first there was no trouble as to hog shipments, which may not yet be involved, but the difference between the old regular rate of \$120 a car-load (\$110 going to the railroads) and the \$70 rate made in Cleveland (to say nothing of the cuts below \$70 now indulged in) would amount to about \$1,700,000 in net profits in a year, and to about \$32,700 per week, and extended to the hogs also it would amount to \$4,000,000. Besides this there is the important, though smaller, business from St. Louis, Cincinnati, etc.

A TRUNK-LINE EXECUTIVE COMMITTEE MEETING was held in New York last Tuesday at which it was agreed to make an effort to divide the east-bound business at a meeting to be held in Chicago Wednesday, June 4. After the elaborate preparations made last month and agreement to maintain rates until an apportionment could be made, rates were immediately cut worse than ever and many contracts made, and there seemed to be little hope of completing the coöperation agreement; but Tuesday's meeting is said to have found all parties anxious to go on and complete the arrangement, though until an actual division is made they do not think it practicable to maintain rates, and do not promise to. More and more it appears impossible to maintain rates without a division of traffic, and the action of this meeting seems virtually a declaration that the agreed apportionment must be the first step, without which it is useless to talk of regular and uniform rates. But all the machinery provided at the April meetings—the Joint Executive Committee, the limitation of the power to make rates on each road to certain specified persons who shall be held responsible for every deviation, and the Board of Arbitrators for the settlement of differences, and especially for fixing percentages of traffic when the roads cannot themselves agree as to what they shall receive severally—all this remains, and so far as can be judged beforehand and with our present experiences of the difficulties attending such efforts at substituting coöperation for competition, it seems well calculated to insure success. At the Chicago meeting the arbitrators will doubtless be on hand, and there apparently will be no reason why the apportionments should not be completed on the spot, or at least put in the way of settlement as soon as the arbitrators can hear and consider the arguments.

It is probably too late to make anything out of the summer traffic. Rates have been low so long that it will be hard to advance them more than a trifle until September. But if no considerable gains can be made, some losses may be prevented. Aside from large contracts at 12½ cents, it is now reported that some grain has been taken from Chicago to New York for 10 cents per 100 lbs.; and then the agreement is not intended simply to bridge over a season, but for an indefinite future period.

Another action of the Executive Committee was with regard to the rates on freight from New York to East St. Louis. These have been 122 per cent. of the Chicago rate. St. Louis people claimed that they should be but 116 per cent. of the Chicago rate, basing their claim on the fact that the distance to St. Louis by the shortest route is about 116 per cent. of the distance to Chicago by the shortest route. In rate-making, however, the distance to Chicago is taken as 963 miles, while the shortest line is but 912 miles. The Executive Committee based the difference on the mean of two different routes to St. Louis and three to Chicago, of which the St. Louis distance is 19 per cent. the longest. Rates to East St. Louis, therefore, from Eastern points hereafter are to be 19 per cent. more than the Chicago rates. To St. Louis there is an addition of the "arbitrary" of 5 cents per 100 lbs. on all classes of freight which goes to the bridge. The new rate is just half-way between the old rate and what the St. Louis interest requested.

THE TRAIN-PEDDLAR may now be expected to join with the committee of the New York Chamber of Commerce in denouncing the tyranny and oppression of President Vanderbilt, whose order interfering with the free exercise of his calling by that enterprising and persistent trader on all the Vanderbilt roads we published recently. But we fear that in this case the sympathy of the traveling community is with the oppressor, whose iron heel they would like to see placed firmly upon the necks of the whole army of those who take advantage of us when we are shut up in cars, where we can't run away, to thrust upon our attention all sorts of things that we don't want, and certainly don't want forced upon us.

LAKE AND CANAL RATES have been but little changed during the past week, most of the time the quotations having

been ¼ cent less by lake and ¼ more by canal—that is, 2½ for corn, and 3 or 3½ per bushel for wheat from Chicago to Buffalo, and 4¼ for corn and 4½ for wheat from Buffalo to New York. Considering the current rail rates, it is surprising that such rates can be had, and their maintenance suggests that only a small proportion of the grain has been taken by rail at the rate of 12½ cents, or less, that has been reported for some contracts. A 12½-cent rate is only 7½ cents per bushel for wheat, and the lowest water rate so far reported would amount to 8½ cents for that grain.

Telegrams received as we go to press report a further reduction of the lake rates ¼ cent on Wednesday.

The Late Asa Packer.

Hon. Asa Packer, President of the Lehigh Valley Railroad Company, and a man who did more than any other single individual for the development of the coal and iron fields of Pennsylvania, died at his city residence, No. 722 Spruce street, at 10:20 last evening. Judge Packer contracted a severe cold in the fall. He was advised by his physician to spend the winter in the South, or at least to take a Southern trip, but he disregarded this advice, and three weeks ago was forced to take to his bed, the cold having caused a deterioration of the blood, which resulted in a loss of muscular power. His symptoms soon became alarming, but nearly two weeks ago the physicians thought he had passed the crisis. He seemed to be improving until about noon on Monday last, when he suffered a relapse, and for some hours his death was looked for momentarily. He rallied, however, on Tuesday, and seemed to be gaining strength until three o'clock yesterday morning, when he began to sink rapidly and continued to grow weaker until, at eight o'clock, he spoke his last word, and from that time until his death he was entirely unconscious. All the chief officers of the Lehigh Valley Railroad had been summoned to his bedside, and in the presence of the officers, the family and the physicians, the great coal king breathed his last. His funeral will not take place in this city, but some time to-day the body is to be removed to Mauch Chunk, and the funeral will take place from his late residence in that town, on Tuesday, at 2 p. m.

JUDGE PACKER'S EARLY LIFE.

Asa Packer was born at Mystic, Connecticut, Dec. 29, 1805. His parents were poor and his early education was confined to what was taught in the rude district schools of those days. At the age of seventeen he started out to seek his fortune. Carrying over his shoulder a small bundle containing all his worldly possessions, a few simple articles of clothing, the plucky lad walked the entire distance from his birthplace to Brooklyn, Susquehanna County, in this state. After weeks of weary marching he arrived in Brooklyn, at the house of his cousin, Edward Packer. The latter was a house carpenter, and with him Asa learned that trade and became a first-rate workman. When the time of his apprenticeship was out he went to New York, where he worked at his trade for a year. He did not like the city, however, and returned to Susquehanna County and settled in Springville township. There he worked at his trade and there, on the 23d of Jan. 1828, he was married to a poor farmer's daughter Sarah M. Blaklee, who survives him. They were married according to the rites of the Episcopal Church, in the parlor of the little country inn, kept by Mrs. Barnes, the bride's sister, at Dimock Four Corners, Susquehanna County. The young couple spent the next four years in farming, having rented a farm which had formerly been worked by Mrs. Packer's father. While Mr. Packer plowed and sowed and gathered the not over-abundant crops, Mrs. Packer milked the cows and administered the household affairs with cheerfulness, energy, neatness and economy. But the crops were poor and markets distant, and at the end of four years they were as poor as when they began. In the winter of 1833, hearing that men were wanted to run coal boats on the Lehigh Canal, Mr. Packer hitched his one horse to a jumper and drove to Mauch Chunk, where he made an engagement for the summer and went home to settle up his affairs. In the spring he returned to Mauch Chunk, walking as far as Tunkhannock, where he boarded a raft and rode to Berwick. He finished the rest of the journey on foot and at once became the commander of a canal boat. He soon afterward contracted for another boat, which he placed in charge of his brother-in-law, James I. Blaklee. During the summer he moved his family to Mauch Chunk, where his home has since been. At the end of two years he was able to retire with some capital from active participation in the boating business, but retained an interest therein. He bought a small store, putting Mr. Blaklee in as manager, while he engaged in canal-boat building. He was prosperous both in the store and the boat yard. In a few years he placed in his store at one time a stock of goods which cost him \$25,000, which was unprecedented in that region in those days. He took large contracts for building locks on the upper Lehigh, which he finished in 1839, with large profits. Mr. Packer was then counted a rich man. In partnership with his brother, Robert, in the following year, he took heavy contracts from Stockton & Stevens, of New Jersey, for building boats at Pottsville, to be constructed for the direct shipment of coal to New York. It took three years to complete these contracts. Mr. Packer then engaged in mining and shipping coal from the Nesquehoning and other mines, and thenceforward uninterrupted prosperity attended him. The Delaware, Lehigh, Schuylkill & Susquehanna Railroad Company, which afterward became the Lehigh Valley Railroad Company, was incorporated by an act of Assembly passed April 21, 1846. There was much opposition to the scheme in the Legislature, and capitalists seemed to have but little faith in it, for it was not until the 2d of August, 1847, that enough subscriptions to its stock could be secured for a beginning. At that time 5,002 shares had been taken, letters patent were issued and the first election for officers was held in October following. During the next four years, however, little was done except some surveys and the grading of about one mile, immediately below Allentown.

BUILDING A RAILROAD SINGLE-HANDED.

On the 31st of October, 1851, Asa Packer bought nearly all the stock which had been subscribed, and, with a view to a prompt construction of the road, began to obtain additional subscriptions. From that time forward the history of the Lehigh Valley Railroad and the history of Asa Packer are inseparably connected. Robert H. Sayre was appointed Chief Engineer of the railroad company, and he completed the survey and location of the line in June, 1852. On the 27th of November of that year Mr. Packer took the contract for building the railroad from Mauch Chunk to Easton, connecting there with the New Jersey Central and Belvidere Delaware railroads, and thus furnishing outlet to its trade to New York and Philadelphia. Judge Packer agreed to receive as payment for this work the company's stocks and bonds, and work was begun at once at Mauch Chunk and Easton. The name of the company was changed in January, 1853, and James M. Porter was elected President. Judge Packer prosecuted this

work with great vigor, overcoming the most formidable obstacles in making the roadway at different points through the rocky bluffs. The work was greatly retarded during the summer of 1853, owing to the prevalence of cholera along the whole line. This enterprise came near sweeping away Judge Packer's entire fortune. The public had not sufficient faith in its success to make its securities sufficiently available for the contractor's needs, but valuable aid was rendered by some gentlemen connected with the New Jersey Central Railroad in the purchase of its stocks and bonds, and the Camden & Amboy Railroad Company loaned Judge Packer its securities. With this assistance he was able to complete his great undertaking, and on June 11, 1855, the road was opened for passenger traffic from South Easton to Allentown, and two trains ran daily until Sept. 12, when the road was opened for travel to Mauch Chunk. Up to this time the road was operated by Judge Packer, with rolling stock hired from the New Jersey Central Railroad Company. The road was accepted from the contractor Sept. 24. The net profit of the road during the first three months of its operation was \$2,781.62. The main office of the company was removed to this city early in 1856, and on this account Judge Porter declined a reelection, and on Feb. 5 William W. Longstreth was chosen President, but resigned in the following May, when J. Gillingham Fell was elected to fill the vacancy. Mr. Fell resigned in 1862, and Judge Packer was elected in his stead and held the office for two years, when he resigned and was succeeded by Mr. Longstreth. In 1868 Mr. Packer was again elected President, which office he continued to hold down to the time of his death.

THE LEHIGH VALLEY'S EXTENSIONS.

The great rival of the Lehigh Valley Railroad Company was the Lehigh Navigation Company, which had a railroad from White Haven to Wilkesbarre, where they connected with their Lehigh Canal. Judge Packer proposed to prorate freight with this company, but his proposition was refused, and the Lehigh Navigation Company extended their road, the Lehigh & Susquehanna, to Easton. In order to get a northern outlet the Lehigh Valley Railroad Company incorporated with itself the Beaver Meadow Railroad and the Penn Haven & White Haven Railroad, by which it got a connection to White Haven, and in the same year, 1865, contracts were let for the extension of the road to Wilkesbarre, to which point the road was opened early in 1867. In 1866 Judge Packer had purchased for the Lehigh Valley Railroad Company a controlling interest in the North Branch Canal, extending from Wilkesbarre to the New York state line, a distance of over one hundred miles, with a charter authorizing the company to change the name to the Pennsylvania & New York Canal & Railroad Company, and to build a railroad the entire length. In September, 1869, this road was opened to Waverley, its northern terminus, the whole distance from Wilkesbarre being 105 miles. In 1871 the company made a perpetual lease of the Morris Canal & Banking Company, by which it came into possession of a line of canal 102 miles long, extending from the terminus of the road at Phillipsburg, opposite Easton, to Jersey City, giving it an independent outlet for its coal trade to New York. Its only railroad connection at Easton to New York, however, was the New Jersey Central Railroad, and the company made a lease of the Lehigh Navigation Company's railroad, canal and mines, and refused to carry freight for the Lehigh Valley Railroad at terms at which it could compete with its rival. Mr. Packer, therefore, built the Easton & Amboy Railroad, running across New Jersey, and giving him an independent outlet to tidewater. This road, which was opened in 1876, cost \$10,000,000, was paid for in cash and all its stocks and bonds are owned by the Lehigh Valley Railroad Company. The company has also connections to Geneva on the New York Central by the Geneva, Ithaca & Sayre Railroad, and to Erie by a third rail laid on the New York & Erie Railroad in 1876. Besides the connections mentioned the Lehigh Valley road has by merger or purchase obtained the control of many minor roads tapping the coal and iron fields of the Lehigh and Wyoming valleys. By Judge Packer's foresight, sagacity and courage these great enterprises were mainly brought about. He took no stock in distant enterprises, like gold or silver mines, but confined all his investments to the territory traversed by his road, so that his mines and his railroad should mutually benefit each other. His wealth is estimated all the way from \$10,000,000 to \$20,000,000. He owned 25 per cent. of the entire capital stock of the Lehigh Valley Railroad Company, besides vast private interests in coal and iron.

JUDGE PACKER'S CHARACTER AND HABITS.

Judge Packer was a man of the most indomitable energy and untiring industry. He was always ready to take a walk of several miles over the ruggedest paths to view a piece of property which was offered for sale. He was very unassuming in his bearing, easily approached and on the most affectionate terms with all his subordinates. In fact, the Lehigh Valley Railroad Company was like a great family arrangement, with Judge Packer at the head. Almost all of the men who now occupy high places in the company rose from subordinate positions. In politics Judge Packer was a strict, but not an ultra, Democrat, and was on the most cordial social relations with his political opponents. He was one of the founders of the Farmers' Club, an association of twelve gentlemen, who met at each other's houses and dined once a month together on the Thursday nearest the full moon. Besides Mr. Packer this club was, before the death of some of the members, composed of Gen. Robert Patterson, John Welsh, W. H. Drayton, George Dawson Coleman, J. D. Cameron, Thomas A. Scott, Samuel Felton, Craig Biddle, F. A. Conly and Morton McMichael. The only political office besides that of Associate Judge of Carbon County that Mr. Packer held was that of Congressman, to which he was elected in 1852 and re-elected in 1854. He was the Democratic candidate for Governor against Gen. Geary in 1869, but was declared not elected.

THE LEHIGH UNIVERSITY.

Judge Packer was the founder of the Lehigh University, which was formally opened Sept. 1, 1867. His original endowment in the institution was \$500,000 and a tract of land containing 56 acres, and he subsequently made liberal donations at various times. Last year he erected there a magnificent library building at a cost of \$79,000, which is dedicated to the memory of his daughter, Mrs. G. B. Linderman, who died a few years ago. This library has shelf capacity for 60,000 volumes, is built of stone, with gray stone front, trimmed with Connecticut granite. Packer Hall, the principal university building, is of stone, 213 feet long, and is a very handsome and complete edifice. It stands on a gentle slope of the Lehigh Mountain range, in the midst of a park of forest trees, and commands a view for 20 miles. Mr. Packer's family residence was in Mauch Chunk, a very handsome house, standing midway up the mountain side overlooking the Lehigh. There was his home, but he kept the splendid residence, No. 722 Spruce street, in this city, with a housekeeper and servants, for the accommodation of himself and the members of his family when in the city. Judge Packer himself generally spent about three days in the week here.

Judge Packer and his venerable wife celebrated their

golden wedding at their Mauch Chunk residence on the 28d of January, 1878. This was the greatest social event that ever occurred in the Lehigh valley. All the children and grandchildren, all the principal officers and many of the employees of the railroad were present and distinguished guests from this city, New York, Baltimore, Allentown, Easton, Wilkesbarre, Pittston, Towanda, Bethlehem and other places. Among the guests were Rev. Samuel Marks, the Episcopal minister who performed the marriage ceremony at Dimock Four Corners fifty years before; Mrs. Amos Williams, who was bridesmaid; James I. Blaklee and Mrs. William Baker, the two latter brother and sister of Mrs. Packer, believed to be the only living witnesses of the wedding at Mrs. Barnes' public house. No presents were permitted at the golden wedding, except from the sons and daughters, who gave Judge Packer a gold watch of antique pattern and Mrs. Packer a pair of spectacles and a watch chain. Judge Packer's residence and that of his son H. E. Packer, adjoining, were filled with a brilliant throng, and the festivities were kept up until a late hour. There were no formal ceremonies, but a poem by Professor Henry Coppée, LL. D., and several other poetical tributes were read, as well as letters from John Welsh, Abraham S. Hewitt, William Elwell, Bishop of Schweinitz, John C. Bullitt, Bishop Stevens and many others. Mr. Packer leaves two sons, Robert A. Packer and Harry E. Packer, both holding important offices in the service of the company, and one unmarried daughter.—*Philadelphia Times*, May 18.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:
Concord, annual meeting, in White's Opera House, Concord, N. H., May 27, at 11 a. m.
Northern (New Hampshire), annual meeting, in Phoenix Hall, Concord, N. H., May 29, at 11 a. m.
Port Wayne, Muncie & Cincinnati, annual meeting, in Fort Wayne, Ind., June 4.
Keokuk & Des Moines, annual meeting, at the office in Keokuk, Ia., June 4, at noon.

Railroad Conventions.

The *Railroad Commissioners* of the various states will hold their third annual convention at Saratoga Springs, N. Y., June 10.

The *Master Car-Builders' Association* will hold its annual convention at the Grand Pacific Hotel, in Chicago, beginning on Tuesday, June 10.

The *American Society of Civil Engineers* will hold its eleventh annual convention in Cleveland, O., beginning June 17.

Mail Service Extensions.

Mail service has been ordered on railroad lines as follows:

East Line & Red River, service extended from Winnaboro, Tex., to Sulphur Springs, 22.91 miles.
Chicago, Burlington & Quincy, Creston & Northern Branch, service extended from Greenfield, Ia., to Fontanelle, 6.80 miles.

Foreclosure Sales.

The *St. Paul & Pacific Branch Line* was sold in St. Paul, Minn., May 7, under the decree of foreclosure granted by the United States Circuit Court. The sale included the line from St. Paul, Minn., to Watab, about 78 miles. Bought by J. S. Barnes, of New York, for \$200,000, for account of the parties who now own a controlling interest in the bonds.

Railroad Commissioners' Convention.

The Executive Committee, Messrs. Briggs, of Massachusetts, Bell, of Ohio, and Harding, of Missouri, give notice that the third general convention of the Railroad Commissioners of the various states will be held at Saratoga Springs, N. Y., beginning June 10, at noon.

Southern Railway & Steamship Association.

A meeting of the Committee on Rates was held in Atlanta, Ga., May 12 and 13. Mr. Virgil Powers, General Commissioner, presided at the meeting, assisted by Mr. Charles A. Sindall, Secretary of the Association. The members of the committee who were in attendance upon the meeting were V. Powers, chairman; R. A. Anderson, E. R. Dorsey, Geo. R. Knox, E. B. Stahlman, C. H. Croley, of the Green Line, Wm. Plummer, B. D. Hasell, Sol. Haas and A. Pope, of the Eastern lines. The meeting was called for the purpose of making changes in rates of freight and to regulate rates and secure uniformity as far as possible. It is understood that the committee completed its work, but the results have not been made public as yet.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—At the annual meeting in Topeka, Kan., May 15, the following directors were chosen: L. Severy, Reading, Kan.; C. K. Holiday, Topeka, Kan.; B. F. Stringfellow, Atchison, Kan.; Sidney A. Kent, Chicago; Thomas Nickerson, Joseph Nickerson, Isaac T. Burr, Alden Spenro, C. J. Paine, B. P. Cheney, C. W. Pierce, George O. Shattuck, George A. Gardner, Boston. The new directors are Messrs. Shattuck and Gardner, who succeed F. H. Peabody and Thomas Sherlock. The board re-elected Thomas Nickerson President; Wm. B. Strong, Vice-President and General Manager; Edward Wilder, Secretary and Treasurer; George L. Goodwin, Assistant Secretary and Assistant Treasurer.

Atchison, Topeka & Santa Fe Leased Lines.—The elections of the more important leased lines are given under their proper headings elsewhere; the minor leased and controlled companies held their meetings last week, when the following officers were chosen: *Cowley, Sumner & Ft. Smith*.—President, C. C. Burr; Vice-President and General Manager, Wm. B. Strong; Secretary and Assistant Treasurer, E. Wilder; Treasurer and Assistant Secretary, G. L. Goodwin. *Elk & Chautauqua*.—President, R. Burns; Vice-President and General Manager, Wm. B. Strong; Secretary and Assistant Treasurer, E. Wilder; Treasurer and Assistant Secretary, G. L. Goodwin. *Kansas City, Topeka & Western*.—President, Thomas Nickerson; Secretary and Assistant Treasurer, E. Wilder; Treasurer and Assistant Secretary, G. L. Goodwin. *Marion & McPherson*.—President, G. C. Lord; Vice-President and General Manager, Wm. B. Strong; Secretary and Assistant Treasurer, E. Wilder; Treasurer and Assistant Secretary, G. L. Goodwin. *Pleasant Hill & De Soto*.—President, G. W. Wilbur; Secretary and Treasurer, G. L. Goodwin. *Wichita & Southwestern*.—President, Isaac T. Burr; Secretary and Treasurer, G. L. Goodwin. *Arkansas Valley Town Co.*—President, Alden Spenro; Secretary and Treasurer, G. L. Goodwin. *Topeka Equipment Co.*—President, G. C. Lord; Secretary and Treasurer, G. L. Goodwin; Assistant Secretary and Assistant Treasurer, E. Wilder. *Florence, Eldorado & Walnut Valley*.—President, Alden Spenro; Vice-President, T. B. Murdock; Secretary, A. L. Redden; Treasurer, G. L.

RAILROAD EARNINGS AND NET EARNINGS, YEAR 1878.

NAME OF ROAD.	Mileage.		GROSS EARNINGS.				Per cent. of expenses.		NET EARNINGS.			
			Total.		Per mile.				Total.		Per mile.	
	1878.	1877.	1878.	1877.	1878.	1877.	1878.	1877.	1878.	1877.	1878.	1877.
Allegheny Valley	250	250	1,910,222	2,492,080	7,375	9,822	52.06	54.05	915,727	1,144,971	3,536	4,421
Atchison & Nebraska	149	149	449,297	411,115	3,015	2,759	78.71	79.61	95,646	83,917	642	563
Atch. Topeka & Santa Fe	808	739	3,950,868	2,679,107	4,893	3,628	51.67	54.47	1,909,393	1,239,656	2,365	1,665
Atlantic & Great Western	515	515	3,748,207	3,973,299	7,279	7,721	79.38	75.61	772,349	908,917	1,501	1,883
Atlantic, Mis. & Ohio	428	428	1,715,459	1,776,018	4,015	4,150	69.42	73.11	525,806	477,600	1,229	1,116
Balt. & Potomac	92	92	639,097	646,323	6,947	7,025	85.48	82.70	92,911	111,789	1,010	1,215
Bangor & Piscataquis	63	63	75,703	57,334	1,211	918	58.30	57.02	31,399	24,835	502	398
Bur. Cedar Rap. & Northern	430	383	1,527,607	1,249,881	3,553	3,263	70.53	66.93	450,024	413,284	1,047	1,079
Bur. & Mo. River	472	472	1,909,518	1,368,502	4,046	2,899	31.38	33.75	1,310,577	906,976	2,777	1,922
In Nebraska	146	146	231,889	242,490	1,588	1,661	90.49	102.13	21,951	25,167	150	.....
Camden & Atlantic	67	67	399,061	477,483	5,956	7,127	69.64	62.92	121,213	177,042	1,809	2,642
Central, of Iowa	191	191	755,658	732,542	3,967	3,848	76.16	71.39	180,081	209,579	945	1,100
Central, of N. J.	378	378	5,589,529	5,753,414	14,767	15,221	58.80	56.81	2,302,769	2,484,846	6,092	6,574
Central Pacific	2,063	1,907	17,607,451	16,471,144	8,413	8,737	50.18	47.20	8,771,096	8,006,736	4,191	4,560
Chartiers	23	23	84,487	77,167	3,700	3,385	46.50	45.05	42,588	43,498	1,868	1,860
Chicago & Alton	678	678	4,671,519	4,464,343	6,982	6,586	53.80	52.79	2,156,385	2,107,337	3,181	3,109
Chicago, Bur. & Quincy	1,056	1,020	14,119,065	12,530,876	8,529	7,733	55.75	58.33	6,247,750	5,221,167	3,773	3,222
Chicago & Lake Huron	232	232	451,479	482,038	1,946	2,078	102.47	129.16	*11,187	*140,498	.....	.....
Chicago, Mil. & St. Paul	1,539	1,412	8,451,768	8,114,894	5,492	5,784	56.70	55.95	3,659,454	3,574,461	2,378	2,548
Cin. & Muskingum Valley	148	148	340,397	366,774	2,294	2,472	63.45	62.94	22,310	23,886	150	174
Cleveland, Col. & Ind.	471	471	3,528,714	3,434,356	7,484	7,284	79.94	85.59	707,880	488,779	1,501	1,037
Cleveland, Mt. Vernon & Del.	157	157	382,608	388,806	2,438	2,478	93.45	78.99	64,871	81,725	521	414
Cleve. & Pittsburg	199	199	2,474,634	2,392,326	10,974	10,009	52.77	53.99	1,168,580	1,100,064	5,182	4,925
Columbus, Chic. & Ind. Central	581	581	3,433,665	3,396,256	5,915	5,831	88.02	86.59	411,514	455,340	709	784
Columbus & Hocking Valley	100	89	871,553	828,900	8,710	9,313	55.22	56.84	391,127	357,756	3,911	4,020
Columbus & Tol. Dakota South'n	124	111	517,871	330,822	4,176	2,988	57.08	63.85	222,259	119,603	1,792	1,080
Dakota South'n & Del. & Bound Brook	61	61	234,300	206,542	3,841	3,370	51.50	51.75	113,539	96,651	1,861	1,633
Del. & Hudson Canal, leased lines	31	31	270,570	238,467	8,813	7,768	56.01	71.80	119,023	67,045	3,877	2,184
Des Moines & Ft. Dodge	472	472	2,829,570	2,835,020	5,995	6,006	57.20	61.17	1,210,926	1,100,853	2,566	2,333
Des Western	20	20	43,285	45,310	2,164	2,266	85.51	78.31	6,262	9,996	313	500
Des Moines & Ft. Dodge	87	87	211,028	148,434	2,433	1,706	64.07	87.61	75,806	18,766	871	216
Detroit, Lansing & Northern	187	182	970,033	788,560	5,187	4,333	61.63	64.08	372,198	282,046	1,990	1,555
Eel River	95	95	206,855	201,311	2,177	2,119	67.16	73.43	67,842	53,723	715	565
Erie & Pittsburg	81	81	541,515	578,192	6,685	7,138	78.98	61.82	157,002	220,846	1,946	2,726
Flint & Pere Marquette	284	284	1,081,148	997,966	3,807	3,517	59.92	58.14	433,370	416,680	1,526	1,468
Freehold & Jamesburg	28	28	51,304	51,397	1,832	1,836	95.78	91.28	2,168	4,480	77	160
Gal. House & Henderson	50	50	495,400	454,305	9,909	9,086	62.75	60.67	184,595	178,680	3,692	2,574
Hannibal & St. J. Huntington	292	292	2,045,450	1,931,365	6,997	6,606	59.96	58.81	818,899	795,479	2,801	2,721
Broad Top	59	59	240,041	261,410	4,051	4,412	52.10	46.53	115,008	139,790	1,941	2,359
Illinois Central	1,225	1,108	7,140,208	6,083,322	5,885	5,034	43.24	46.72	4,052,773	3,560,877	3,227	3,215
Indianapolis & Vincennes	269	267	1,347,247	1,385,875	5,046	5,340	76.61	76.83	313,904	321,205	1,170	1,203
Int. & Mt. No. Jeffersonville	519	519	2,82,558	264,445	2,415	2,260	68.00	109.27	5,349	*24,472	46	.....
Madison & Indianapolis	225	225	1,150,014	1,176,175	5,111	5,227	63.22	50.77	422,988	497,232	1,876	2,210
Kan. City, St. Jo. & Coun. Bluffs	252	252	1,533,650	1,433,791	6,086	5,650	70.78	68.76	448,059	444,096	1,878	1,765
Kansas Pacific	673	673	3,010,224	3,284,734	4,484	4,884	59.57	58.96	1,450,464	1,367,777	2,169	2,031
Lake Shore & Mich. So.	1,177	1,177	13,979,706	13,505,159	11,877	11,484	60.70	66.37	5,493,166	4,541,193	4,067	3,862
Leavenworth & Gal. Lawrence	188	188	439,604	410,337	2,338	2,183	64.00	64.80	158,265	144,366	842	768
Little Miami	199	199	1,223,601	1,293,080	6,247	6,616	77.51	75.13	275,177	322,337	1,405	1,646
Maine Central	355	355	1,440,061	1,654,237	4,058	4,570	58.35	60.69	509,957	650,699	1,690	1,833
Marq. Houghton & Ontonagon	80	80	566,452	675,732	6,365	7,592	47.22	48.77	299,181	346,093	3,392	3,888
Memphis, Paducah & No.	115	115	186,324	189,584	1,620	1,649	70.57	66.11	38,324	63,971	333	556
Mich. Central	804	804	6,872,064	6,561,435	8,550	8,164	63.55	68.71	2,054,855	2,052,953	3,117	2,554
Mis. Kan. & Tex.	786	786	2,981,082	3,197,322	3,794	4,068	77.22	63.64	678,943	1,162,389	864	1,479
Mobile & Montgomery	179	179	680,183	666,037	3,800	3,721	62.03	66.28	258,390	224,561	1,444	1,255
Montpelier & Wells River	38	38	73,512	77,153	1,935	2,030	72.90	64.11	19,862	27,664	523	728
Morris & Essex	137	137	2,710,117	3,368,441	19,782	24,587	71.13	63.71	782,328	1,222,507	5,710	8,923
Nashville, Chat. & St. Louis	349	345	1,631,681	1,749,209	4,675	5,070	64.03	59.84	570,975	702,587	1,653	2,036
Natchez, Jacks'n & Columbus	36	34	25,441	23,093	707	685	59.04	54.11	10,421	11,006	280	319
N. J. Midland	85	85	483,824	428,701	5,692	5,044	74.70	81.40	122,406	79,676	1,440	938
N. J. & N. Y.	37	37	159,251	168,596	4,304	4,557	96.08	100.00	5,522	.....	150	.....
N. J. Southern	174	174	344,020	393,806	1,982	2,263	94.11	85.60	20,251	55,547	116	319
Northern Central	326	326	3,723,457	4,070,388	11,422	12,486	69.65	67.46	1,118,960	1,324,463	3,432	4,063
Ogden Mine	10	10	18,194	15,520	1,819	1,552	64.54	57.45	7,447	6,616	745	661
Ohio & Mis. Main Line	387	387	2,799,597	1,856,000	7,234	4,797	68.15	68.85	891,467	578,123	2,304	1,494
Oregon & California	200	200	648,116	685,374	3,241	3,427	63.34	56.10	237,665	302,827	1,188	1,514
Penn. Main Line and Branches	1,055	1,055	20,317,140	18,993,459	19,258	17,994	53.75	56.63	9,306,037	8,232,318	8,906	7,803
Phila. & Erie	288	288	2,921,061	3,172,993	10,143	11,017	70.00	64.60	876,112	1,123,365	3,042	3,901
Pittsburgh, Cin. & St. Louis	201	201	3,176,371	3,097,962	15,834	15,043	62.64	65.30	1,186,764	1,075,040	5,916	5,359
Pittsburgh, Ft. Wayne & Chic.	468	468	7,830,109	6,928,856	16,731	14,805	52.88	58.66	3,689,196	2,864,458	7,863	6,121
Pittsburg, Titusville & Buffalo	123	123	526,701	687,072	4,282	5,586	64.96	62.28	184,502	259,164	1,501	2,107
Pitts., Virginia & Charleston	30	30	135,969	120,019	4,532	4,301	61.52	70.47	52,299	38,169	1,743	1,270
St. Jo. & Denver City	227	227	441,391	518,886	2,826	2,286	90.51	90.24	61,182	50,525	270	223
St. Louis, Iron Mt. & N. Y.	685	685	4,514,321	4,500,423	6,595	6,575	56.89	52.63	1,945,956	2,131,902	2,843	3,115
St. Louis, Kan. City & No.	530	530	3,324,496	3,147,174	6,279	5,944	59.47	70.25	1,347,500	1,250,773	2,545	2,362
St. Louis & St. E.	354	354	1,186,921	1,099,503	3,353	3,106	76.12	77.34	283,331	249,407	800	705
St. Paul & Sioux City	122	122	604,186	544,905	4,952	4,467	60.14	61.90	240,938	207,632	1,975	1,702
Sioux City & St. Louis	148	148	387,544	342,938	2,618	2,317	67.99	66.32	123,740	115,470	836	780
So. Minnesota	181	170	680,081	653,533	2,533	2,033	78.16	57.16	311,152	296,266	1,719	1,710
Sussex	35	35	102,017	102,734	2,915	2,935	70.69	65.41	29,914	35,363	855	1,010
Tuckerton	31	31	24,262	27,623	783	891	98.33	77.04	367	386	12	205
Union Pacific	1,042	1,042	13,121,273	12,948,477	12,502	12,477	40.98	42.88	7,344,686	7,396,384	7,433	7,028
United N. J.	373	373	8,398,534	8,900,097	19,131	20,412	65.50	69.50	2,895,592	2,732,966	6,596	6,696
Wash.	678	678	4,998,372	4,585,914	7,372	6,704	69.52	72.61	1,523,427	1,256,113	2,247	1,853
Warren	19	19	303,412	342,737	15,909	18,039	39.69	34.72	183,138	223,637	9,349	11,770
Wash. City, Va. Mid. & Gt. So.	310	310	1,218,117	1,005,518	3,929	3,244	65.93	69.30	415,117	311,025	1,339	1,093
West Jersey	128	128	541,678	595,025	4,232	4,943	62.53	65.78	292,985	303,565	1,586	1,589
Wilmington & Northern	64	64	129,581	135,9								

Goodwin, Kansas City, Emporia & Southern.—President, Warren Sawyer; Vice-President, Wm. B. Strong; Secretary and Assistant Treasurer, E. Wilder; Treasurer and Assistant Secretary, G. L. Goodwin.

Brownsville & New Haven.—At the annual meeting in Brownsville, Pa., recently, the following were chosen: President, Charles Donnelly; Directors, D. Kline, A. L. McFarland, W. H. Markle, A. N. Tintman, G. W. Wilson; Secretary and Treasurer, W. McCullough.

Cheshire.—At the annual meeting in Keene, N. H., May 14, the following directors were chosen: Samuel Gould, John B. Meer, Ephraim Murdock, Jr., Wm. A. Russell, Edward C. Thayer, George F. Williams, James H. Williams. The board elected Wm. A. Russell, President.

Chicago & Blue Island Elevated.—The following are the officers of this new company: G. W. Waite, President; Norman B. Rexford, Vice-President; D. W. Horne, Secretary; C. B. Sammons, Treasurer; Charles W. Dean, Financial Agent.

Cincinnati, Mt. Airy, Venice & Liberty.—This company was organized May 10 by the election of the following directors: John Chadwick, George W. Dick, Charles R. Haskins, Herman Levi, Anthony Shouter, John P. Waterhouse, John D. Watson. The board elected John P. Waterhouse, President; Anthony Shouter, Vice-President; Charles R. Haskins, Secretary; Herman Levi, Treasurer.

Council Bluffs & St. Louis.—At the annual meeting in Council Bluffs, Ia., May 13, the following directors were chosen: D. H. Solomon, Council Bluffs; J. F. How, John Jackson, B. W. Lewis, Jr., John R. Lionberger, Wm. Spear, St. Louis. The company is building the Iowa end of the St. Louis, Kansas City & Northern's new line to Council Bluffs.

Denison & Pacific.—Mr. L. S. Hamilton has been appointed Superintendent of Transportation, and as such will, from and after May 1, have charge of the movement of all trains, also of the track, bridges, buildings, and telegraph office at Denison, Texas.

Detroit & Bay City.—At the annual meeting in Detroit, Mich., May 15, the following directors were chosen: Ashley Pond, Detroit; Wm. L. Scott, Erie, Pa.; Percy R. Pyne, R. G. Robison, Samuel Sloan, Moses Taylor, Augustus Schell, William K. Vanderbilt, Cornelius Vanderbilt, New York.

Georgia.—At the annual convention in Augusta, Ga., May 14, the following were chosen: President, E. P. Alexander; Directors, J. W. Davies, Jas. S. Hamilton, Stevens Thomas, M. P. Stovall, George T. Jackson, L. M. Hill, Josiah Sibley, H. D. McDaniel, George Hillyer, John Davison, William M. Reese, Charles H. Phinizy, John H. James, Joel A. Billups, N. L. Hutchins, H. H. Hickman. The board re-elected Col. S. K. Johnson Superintendent.

Hanover Junction, Hanover & Gettysburg.—At the annual meeting in Hanover, May 12, the following were chosen: President, A. W. Eichelberger, Hanover, Pa.; Directors, Jacob Forney, Peter Flickinger, Wm. Grumbine, Stephen Keefer, John Nymen, R. M. Wirt, Reuben Young, Hanover, Pa.; Matthew Eichelberger, David Wills, Gettysburg, Pa.; Wm. Buehler, Baltimore.

Iowa Northern Central.—At the annual meeting in Iowa City, Ia., May 7, the following directors were chosen: Julius G. Brown, Le Grand Byington, M. T. Close, Charles Lewis, Benjamin Owen, J. T. Turner, of Johnson County, Ia.; Jesse Boyd, J. F. Brown, J. K. Marbourg, of Washington County, Ia.

La Crosse & Omaha.—This company has been organized at La Crosse, Wis., with the following officers: President, C. L. Coleman; Vice-President, Alexander McMillan; Secretary, Ellis B. Usher; Treasurer, John S. Medary.

LaFayette, Bloomington & Muncie.—Mr. W. S. Weed has been appointed General Freight Agent, with office in LaFayette, Ind. He has been for some time connected with the Canada Southern.

Manchester & Keene.—At the annual meeting in Keene, N. H., May 15, the following directors were chosen: Simeon G. Griffin, George R. Twitchell, Keene, N. H.; Gilbert Wadleigh, Milford, N. H.; Edward P. Emerson, Dana Sargent, J. Sawyer, Jr., Theodore H. Wood, Nashua, N. H.; A. B. Harris, Springfield, Mass.; John H. Buttrick, Lowell, Mass.; Josiah G. Graves, Scituate, Mass.; Henry M. Clarke, Boston. The board elected Theodore H. Wood, President; John H. Buttrick, Treasurer; Thomas E. Hatch, Clark and Assistant Treasurer.

Mankato & St. Cloud.—At a meeting held in Mankato, Minn., May 13, the following officers were chosen: W. T. Bonniwell, President; J. A. Willard, Vice-President; Gen. James H. Baker, Secretary; N. B. Clark, Assistant Secretary.

Master Mechanics' Association.—At the convention in Cincinnati last week the old officers were re-elected for another year, as follows: President, N. E. Chapman, Cleveland, O.; First Vice-President, Reuben Wells, Jeffersonville, Ind.; Second Vice-President, J. N. Lauder, Concord, N. H.; Secretary, J. H. Setchel, Cincinnati; Treasurer, S. J. Hayes, Chicago.

Missouri, Kansas & Texas.—At the annual meeting in Parsons, Kan., May 21, the following directors were chosen: C. H. Pratt, Humboldt, Kan.; B. P. McDonald, Ft. Scott, Kan.; E. D. Barbour, Sharon, Mass.; Moses Williams, Brookline, Mass.; D. Clark, J. M. Forbes, George C. Crocker, John M. Lyman, I. M. Sargent, Boston; J. T. Agnew, Geo. C. Clark, B. P. McCready, New York.

Montgomery & Eufrata.—Mr. W. G. Raoul has been appointed General Superintendent, with office at Macon, Ga., and Edward McIntyre Treasurer, with office at Savannah, Ga. The offices of General Freight Agent, General Ticket Agent, General Passenger Agent and Master of Transportation are abolished, and all communications will be sent to the General Superintendent.

New Mexico & Southern Pacific.—At the annual meeting in Clifton, N. M., May 8, the following directors were chosen: W. W. Griffin, J. L. Johnson, Miguel A. Otero, Henry L. Wade, Santa Fe; Thomas Sherlock, Cincinnati; I. T. Burr, John T. Morse, Jr., Joseph Nickerson, Thomas Nickerson, Charles J. Paine, George B. Wilbur, Boston. The board elected Thomas Nickerson, President; M. A. Otero, Vice-President; Wm. B. Strong, General Manager; Jefferson Reynolds, Secretary; George L. Goodwin, Treasurer. The road is controlled by the Atchison, Topeka & Santa Fe.

New York Elevated.—Mr. Caleb Wright has been appointed Supervisor of Track. He was recently on the Pennsylvania road.

Pekin, Lincoln & Decatur.—At the annual meeting in Pekin, Ill., May 13, the three directors whose terms then expired were re-elected, as follows: H. W. Hippen, K. Harwood, E. Richards. The board re-elected C. R. Cummings, President; R. B. Latham, Vice-President; R. A. Bunker, Secretary and Treasurer.

Pennsylvania.—Mr. David E. Dale has been appointed Road Supervisor of the Amboy Division, in place of Caleb Wright, who has gone to the New York Elevated road.

Pittsburgh, Fort Wayne & Chicago.—At the annual meeting in Pittsburgh, May 21, the three directors whose terms then expired were re-elected, as follows: S. B. Harrison, Hon. John Sherman, Thomas A. Scott.

Pueblo & Arkansas Valley.—At the annual meeting in Pueblo, Col., May 10, the following directors were chosen: O. H. P. Baxter, James C. Collum, M. D. Thatcher, Pueblo, Col.; Wm. B. Strong, Topeka, Kan.; W. J. Rotch, New Bedford, Mass.; B. F. Cheney, Joseph Nickerson, Thomas Nickerson, L. M. Sargent, Boston. The board elected Joseph Nickerson, President; M. D. Thatcher, Secretary and Treasurer; S. W. Reynolds, Assistant Secretary and Assistant Treasurer. The road is leased to the Atchison, Topeka & Santa Fe.

St. Joseph Bridge Co.—Messrs. H. R. W. Hartwig, W. B. Johnson, O. M. Spencer and W. M. Wyeth have been chosen directors, in place of C. H. Nash, B. Patton, J. J. Tracy and E. Wenz, resigned.

St. Louis, Kansas & Arizona.—Mr. S. T. Emerson has been appointed Chief Engineer.

St. Louis & San Francisco.—At a meeting of the board of directors held May 13, Mr. C. W. Rogers was elected General Manager. This is a new office on this road. Mr. Rogers has been General Superintendent.

Seaboard & Roanoke.—At the annual meeting in Norfolk, Va., recently, the following were chosen: President, John M. Robinson, Baltimore; Directors, David A. Barnes, Richard Dickson, Norfolk; R. G. Hoffman, Enoch Pratt, Baltimore; Nulbro Frazier, Moncure Robinson, Philadelphia.

Toledo, Ann Arbor & Northeastern.—The officers of this new company are: President, J. J. Green; Secretary, L. W. Stanton; Treasurer, J. D. Norton; Attorney, J. Teneyck.

United States Rolling Stock Co.—As already announced, Mr. A. Hegewisch, heretofore General Manager and Secretary, has been elected President and General Manager. Mr. D. M. Monjo, heretofore Treasurer, has been elected Treasurer and Secretary.

Wabash.—Mr. Wm. Wilson has been appointed Master Mechanic of the Eastern Division, in place of Chauncey Morris resigned. Mr. Wilson has been for many years on the Chicago, Burlington & Quincy.

West Chicago Elevated.—This new company has elected the following officers: Brian Philpot, President; Henry L. Dietrich, Vice-President; Walter M. Jackson, Secretary; Charles W. Weston, Treasurer; J. W. Bennett, Attorney; George W. Waite, Engineer.

PERSONAL.

—Mr. A. G. Clark, a prominent citizen of Manchester, Vt., died in that town May 11, after a long illness. He was at one time President of the old Western Vermont Railroad Company, afterward part of the Harlem Extension Company.

—Mr. J. V. Patten, Superintendent of the Emlenton, Shipperville & Clarion road, has resigned, on account of the consolidation of management with the Foxburg, St. Petersburg & Clarion.

—Mr. Wm. H. Vanderbilt, with his son George, sailed from New York for Europe in the *Helvetia*, May 17. Commodore C. K. Garrison was a passenger on the same ship.

—It is reported that Mr. L. Williams has resigned his position as General Superintendent of the Cincinnati, Hamilton & Dayton road.

—Mr. Charles Howard has resigned his position as General Superintendent of the Cincinnati, Sandusky & Cleveland road, to take effect July 1.

—At the recent annual meeting of the Atchison, Topeka & Santa Fe Company, Mr. F. H. Peabody having declined a reelection on account of his absence in Europe, the following resolutions were adopted unanimously:

"Resolved, That recognizing and remembering as we do the efficient aid given this road by our associate, F. H. Peabody, by counsel, influence and generous financial support, at the most critical period of its existence, when its prospects were dim, its credit poor and its valuable land grant depended upon its immediate extension, it is with deep regret that we receive his declination of a reelection.

"Resolved, That we tender him our most hearty thanks for his endeavors to promote union and harmony in our board, for his devotion and energy in furthering the best interests of the road and for his uniform courtesy, uprightness and ability during his seven years' service as Vice-President and director.

"Resolved, That these resolutions be spread upon the records of the company, and a copy be sent him by the Secretary."

—The stockholders of the Atchison, Topeka & Santa Fe Company at their recent annual meeting unanimously adopted the following resolutions:

"Whereas, The general management of the Atchison, Topeka & Santa Fe Railroad and its several branches and leased lines in Colorado and New Mexico, has for the past year devolved upon William B. Strong, Esq.,

And Whereas, In addition to the many ordinary and arduous duties resting upon him as General Manager, he has had charge and control of many important legal questions, involving vital rights of the company in Colorado, and also matters of grave interest seriously affecting the rights of the company before the Legislature of the state of Kansas;

Now, Therefore, as a fit and well deserved tribute to him for his ability, energy and faithfulness as a railroad manager, and as a full indorsement of his conduct as such manager,

Be it Resolved, That this company has full faith in the ability, energy and capability of William B. Strong, and it fully indorses and approves his course and policy in the general management of the business committed to his care, and of which he has had charge, and for which he is entitled to and deserves to have, and is hereby tendered the thanks of the company.

Resolved further, That the Secretary of this company is directed to present him with a certified copy of these resolutions.

—Mr. William H. Consett, of Newark, N. J., who was at one time for two years Treasurer of the Morris & Essex Railroad Company, was killed in Rosita, Col., May 19, in a quarrel with some parties who had induced him to go to Colorado to start a bank in the Leadville mining region.

—Hon. Asa Packer, President and chief owner of the Lehigh Valley Railroad, died in Philadelphia, May 17, and was buried in Mauch Chunk, Pa., May 20. An extended obituary of him will be found elsewhere. It is understood that he has made provision in his will for the disposition of the securities of the road in which his great fortune was mainly invested. His two sons have been trained up in

the management of the road, and it is not likely that his death will cause any change in the policy of the company.

—Mr. C. B. Wright has offered his resignation as President of the Northern Pacific Company. He is suffering from a disease of the eyes, which will require an operation to save the sight.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending March 31:	1878-79.	1877-78.	Inc. or Dec.	P. c.
Concord.....	\$733,004	\$771,172	D. \$38,168	4.9
Net earnings.....	318,847	340,454	D. 21,607	6.3
Year ending April 30:				
Detroit & Bay City....	\$388,885	\$358,394	I. \$30,491	8.5
Net earnings.....	94,906	84,719	I. 10,187	12.1
Six months ending March 31:				
Cheshire.....	\$185,849	\$227,024	D. \$41,175	18.4
Four months ending April 30:				
Cairo & St. Louis.....	1879.	1878.		
Cleve., Mt. Vernon & Del.....	\$71,045	\$63,160	I. \$7,885	12.5
Flint & Pere Marquette.....	113,770	119,157	D. 5,387	4.5
International & Great Northern.....	355,489	319,717	I. 35,772	11.2
Memphis, Paducah & Northern.....	514,301	427,232	I. 87,129	20.4
Paducah & Elizabeth town.....	50,829	66,732	D. 15,903	23.8
Month of April:				
Cairo & St. Louis....	\$19,385	\$19,302	I. \$83	0.4
Cleve., Mt. Vernon & Del.....	30,402	32,363	D. 1,960	5.9
International & Great Northern.....	82,937	79,492	I. 3,445	4.3
Memphis, Paducah & Northern.....	9,707	14,109	D. 4,402	31.2
Paducah & Elizabeth town.....	19,007	22,979	D. 3,972	14.7
St. Louis & South-eastern, St. Louis Div.....	44,116	48,113	D. 3,997	8.3
St. Louis & S. E., Ky. Div.....	25,611	26,721	D. 1,110	4.2
St. Louis & S. E., Tenn. Div.....	11,839	13,241	D. 1,402	10.6
Second week in May:				
Chicago, Mil. & St. Paul.....	\$188,000	\$176,250	I. \$11,741	6.7
Week ending May 9:				
Great Western.....	\$74,716	\$78,618	D. \$3,902	5.0
Week ending May 10:				
Grand Trunk.....	\$151,016	\$150,269	I. \$747	1.1

Coal Movement.

Coal tonnages for the week ending May 10 are reported as follows:

	1879.	1878.	Inc. or Dec.	P. c.
Anthracite.....	552,430	378,477	I. 173,953	46.0
Semi-bituminous.....	70,823	58,967	I. 11,856	20.0
Bituminous, Pennsylvania.....	33,527	35,845	D. 2,318	6.5
Coke, Pennsylvania.....	23,147			
The Reading's new leases will, it is thought, result in a considerable increase in the amount of coal put on the New York market by that company. They will also give it almost complete control of the Philadelphia local market.				
The coal tonnage of the Pennsylvania Railroad for the four months ending April 30 was as follows:				
	1879.	1878.	Increase.	P. c.
Anthracite.....	292,638	187,311	105,327	56.2
Semi-bituminous.....	571,988	494,939	77,049	15.6
Bituminous.....	545,181	515,102	30,079	5.8
Coke.....	400,352	330,794	69,558	21.0
Total.....	1,810,159	1,528,146	282,013	18.5

The increase in anthracite is especially notable. Nearly all the semi-bituminous coals show an increase this year, Clearfield leading. Cumberland shipments over this line are also gaining largely.

Cotton.

Receipts of shipping markets for the week ending May 16, and for the crop year from Sept. 1 to May 16 are reported as follows by the *Commercial and Financial Chronicle*, in bales:

	1879.	1878.	1877.	1876.	1875.
Week.....	19,897	20,097	16,288	19,905	18,379
Crop year.....	4,355,935	4,158,152	3,873,227	3,987,774	3,379,335

The receipts this year are 4.7 per cent. larger than last.

Weighting Cars at Chicago.

A meeting was held in Chicago, May 13, at which were present Messrs. Marvin Hughitt, James C. Smith, C. W. Smith, J. C. McMullin, Horace Tucker, Robert Forsythe, J. T. Sanford, John Newell and J. W. Midgley. Mr. Hughitt presided. The meeting was an informal one, and the question discussed was the establishment of a rule requiring the weighing of all cars leaving the city. No action was taken, the matter being postponed until another meeting can be held.

Grain Movement.

Receipts and shipments of grain of all kinds at the eight reporting Northwestern markets, and receipts at the seven Atlantic ports have been as follows, in bushels, for the week ending May 10 of the past six years:

	Northwestern			Atlantic.	
	Receipts.	Shipments.	By rail.	P. c.	Receipts.
1874..	3,169,221	3,022,086	929,349	27.7	4,635,555
1875..	2,536,565	3,478,238	1,236,079	35.6	1,642,615
1876..	2,302,046	3,841,466	2,302,940	60.1	3,909,903
1877..	2,853,906	2,525,207	1,214,861	48.1	2,684,629
1878..	4,369,785	4,822,441	1,901,649	39.5	5,704,275
1879..	3,559,963	4,175,308	1,664,849	39.9	4,450,571

The receipts of the eight Northwestern markets were a sixth less than in the preceding week, but only once before—in January—have been exceeded this year. The shipments of these markets were also less than in the preceding week. The rail shipments are the smallest since January, but are still large for a week during open navigation. The Atlantic receipts were materially larger than in the week preceding, but they have been exceeded in six weeks since February. They have not yet felt the effect of canal deliveries.

Shipments of grain from Buffalo during the week were 858,342 bushels by rail and 642,823 by canal, the latter having been open but three days.

Of the receipts at Atlantic ports during the week this year, 26 per cent. arrived at New York, 25.8 at Baltimore, 25.1 at Philadelphia, 9.4 at Boston, 8 at New Orleans, 5.6 at Montreal, and 0.1 per cent. at Portland. New York's quantity and percentage are the smallest of the year, Philadelphia's and Baltimore's are about the average of recent weeks.

The prevailing rates from Chicago to New York were, by rail, 9 cents per bushel for wheat and 8.4 cents for corn. Lake and canal rates were about 7½ cents for corn and 8½ for wheat.

Receipts and shipments at Chicago and Milwaukee for the week ending May 13 (Tuesday) were:

	Receipts.	Shipments.
Chicago.....	1,738,054	3,363,549
Milwaukee.....	533,300	680,800

The Chicago receipts were much smaller, and the shipments of both places much larger than in the preceding week.

Receipts at Buffalo since May 5, when the first cargo arrived by lake, and the shipments from May 8, when the canal opened, to May 13 were:

	Receipts.	Shipments.
By rail.....	1,130,700	955,359
By water.....	2,608,236	1,518,476
Total.....	3,738,936	2,473,835

Of the receipts 90 per cent. and of the shipments 88½ per cent. were by rail.

For the week ending May 20 receipts and shipments at Chicago and Milwaukee were:

	Receipts.	Shipments.
Chicago.....	1,819,404	3,073,859
Milwaukee.....	527,500	529,600

Both receipts and shipments are somewhat less than for the preceding week.

Receipts and shipments at Buffalo for the same week were:

	Receipts.	Shipments.
By rail.....	692,800	1,149,042
By water.....	1,954,338	1,171,013
Total.....	2,657,138	2,320,055

The rail shipments thus appear to have been nearly as great as the canal shipments for the week.

For the same week ending May 20 and the two weeks preceding, receipts at the four leading Atlantic ports were:

	May 20.	Week ending May 13.	May 6.
New York.....	1,879,588	1,069,750	1,244,333
Philadelphia.....	1,159,200	1,118,800	1,188,300
Baltimore.....	727,050	1,061,604	1,635,036
Boston.....	306,083	441,425	289,380
Total.....	4,162,521	3,721,579	3,757,049

Only for the week ending May 20 were any canal receipts reported at New York, and then but 407,082 bushels, or 22 per cent. of the whole, against 1,990,636 bushels, or 67 per cent. of the whole, in the corresponding week last year. New York's proportion of the whole in this last week is 45 per cent., against 30 per cent. the preceding week.

San Francisco receipts for the week ending May 10 were 5,403 barrels flour, 392,460 bushels of wheat, 40,250 bushels barley and 24,738 bushels other grain; total, reducing flour to wheat, 484,463 bushels. Very little corn comes to San Francisco; the receipts for this week are the largest we have ever noticed, and they were only 22,913 bushels. For many weeks the corn received will be only a few hundred bushels a week.

THE SCRAP HEAP

Railroad Equipment Notes.

The Barney & Smith Manufacturing Co., at Dayton, O., lately delivered six first-class passenger cars to the Cincinnati, Hamilton & Dayton road.

The Old Colony shops in South Boston are building four new passenger cars to be run on the steamboat train between Boston and Fall River. They will seat 74 passengers each, and are very handsomely finished.

Iron and Manufacturing Notes.

The Glendower Iron Works at Danville, Pa., are working on a contract for 3,000 tons of iron rails for the Northern Pacific, and have taken another order for 1,750 tons to go to Vermont.

The Toucey & Buchanan Interlocking Switch Co. is now putting up its signals on the New York Elevated road at the South Ferry and 98th street stations; on the Metropolitan Elevated at 58th street, 91st street and 104th street; on the Baltimore & Ohio at the Edgar Thomson Steel Works, near Pittsburgh, and on the Long Island road at Bedford Junction, where the Brooklyn, Flatbush & Coney Island connects.

The Pennsylvania Steel Co., at Baldwin, Pa., has an order for 5,000 tons of steel rails for the Northern Pacific.

The Rome (N. Y.) Iron Works are making 2,500 tons of iron rails for the Northern Pacific.

The new mill of the Central Iron Works, at Harrisburg, Pa., in seven weeks ending May 3 made 1,070 tons of boiler-plate and tank iron from three heating furnaces.

The Cleveland (O.) Rolling Mill Co. has an order for 6,000 tons of steel rails for the Northern Pacific.

The new blast-furnace of the Southern States, Coal, Iron & Land Co., at South Pittsburgh, Tenn., was recently started up, and is now making 100 tons of iron a day.

Bridge Notes.

The Kansas City Bridge Co. has taken a contract to build an iron bridge over the Kaw River for the Kansas Pacific road.

The Detroit Bridge and Iron Co. is building an iron bridge 390 ft. long over the River Rouge, near Plymouth, Mich., on the Detroit, Lansing & Northern road.

Messrs. Rust & Coolidge, engineers and bridge-builders, have established their office in the Hawley Building, Dearborn street, Chicago. The firm is a new one; both the members were recently with the American Bridge Co.

Prices of Rails.

We learn of a sale of 5,000 tons of steel rails at \$45 at tide-water, with inquiries for next year's delivery at same figure. We also note a sale of 4,000 tons of iron rails, and 2,000 tons of steel rails on private terms, and of several hundred tons of steel rails for early delivery at \$47 at tide-water. The rail business is the most encouraging of any branch of the iron trade. We quote steel rails at \$45 and iron rails at \$37 to \$38, both at tide-water.—*Engineering and Mining Journal*, May 17.

Old Ties.

A conductor on the Burlington, Cedar Rapids & Northern road lately told in a revival meeting how he had run his caboose from Cedar Rapids to Pottsville with a broken flange on one wheel, trusting that the Lord would keep it on the track. But a few days afterward he got a letter from the Superintendent saying that he didn't believe the Lord had much to do with running freight trains, and now that conductor has no caboose to run—not even one with a broken wheel.

On Friday last Engineer Clark, of Erie engine No. 481, found a black snake four feet ten inches long in the hose connecting the tank of his engine with the pump. He had found difficulty in working it, and on examination found his snake-ship, who was so large that the stoppage was complete. The water had been taken at Middletown, and as it was the same as that in daily use there, this may go far toward explaining the frequent presence of snakes in those honest villagers' boots.—*Faterson (N. J.) Press*, May 19.

Hash Knife, a new post-office just established in Texas, may be fairly held to balance Fried Liver, in Arizona. A traveler by the Southern Pacific may hereafter be able to breakfast at one and dine at the other.

A Southern Fast Freight Train.

Lynchburg tobacco dealers desiring to be the first to reach the New Orleans market after the reduction in tax on May 1 secured a special fast train to run between the two cities, the time of which is reported as follows:

	Miles.	Average per hour.
Left Lynchburg 9 a. m., arrived Bristol 10 p. m.		
At. Miss. & Ohio.....	204	15.69
Bristol 12 mid., Chattanooga 3:15 p. m., East Tenn., Va. & Ga.....	242	15.87
Chattanooga 4 p. m., Meridian, 10:55 a. m., Ala. Great Southern.....	295	17.10
Meridian, 10:30 a. m., Jackson, 4:45 p. m., Vicksburg & Meridian.....	96	15.10
Jackson, 5:30 p. m., New Orleans, 4:35 a. m., Chicago, St. Louis & N. O.....	183	16.51
Total actual running time, 64½ hours.....	1,020	15.71

The stops were for inspection, etc., and change of engines. The tobacco reached New Orleans ahead of that by any other line.

The Pennsylvania Observation Cars.

Car No. 62 of the Pennsylvania Railroad is now lying in the yard above the Union Depot, and as it is one of their new "Observation Cars," it is worthy of notice. Unlike the cars of this description in use on the Union and Central Pacific Railroads, it is provided with a roof, which certainly will not detract from the comfort of the passengers, nor indeed to any considerable extent obstruct the view. The car seems to be one of the old style passenger coaches remodeled, as its outside appearance is in color, design, etc., the same, excepting that all that portion from the lower line of the windows up to the lower line of the roof has been entirely cut away, and the roof now rests on a suitable number of small fluted iron columns, thus leaving the car open on end and sides. The seats are of handsome wood-work, and the whole arrangement is light, airy and pleasant. They will add another charm to that already charming journey over the mountains, and will be fully appreciated by the traveling public. On each side of the coach, in gilt letters, is the name, "Observation Car."—*Pittsburgh Telegraph*, May 15.

OLD AND NEW ROADS.

Arkansas Midland.—This company has been negotiating for the rails for an extension of its road from Clarendon Ark., westward to Little Rock, some 60 miles. The extension would be parallel to and only a few miles south of the Memphis & Little Rock.

Atchison & Nebraska.—Propositions for voting bonds in aid of an extension of this road from Lincoln, Neb., northwest to Columbus on the Union Pacific, about 55 miles, are now pending in Seward, Butler and Platt counties.

Atchison, Topeka & Santa Fe and the Denver & Rio Grande.—In the suits between these companies in the United States Circuit Court for Colorado, May 15, the Court gave the Atchison Company leave to file a supplemental bill and litigate thereby the question whether the Rio Grande Company by lease or other contracts admitted the right of the Atchison Company to continue its construction upon its located line. The Court also held that, in any view of the case, the road-bed of an adverse company could only be appropriated by payment of the cost of construction, justly computed; but the question of release raised by the supplemental bill must first be determined.

Baltimore & Ohio.—The *Baltimore Gazette* of May 21 says: "It has been rumored for some days that the Baltimore & Ohio Railroad Company had at last determined to build their main office on the lot corner of Baltimore and Calvert streets. The architect, Mr. E. F. Baldwin, has had several conferences with President Garrett, which have resulted in a complete change in the architectural plan of the building from that originally contemplated. Five years ago, when the project was first broached, plans were drawn of a fine, imposing building, eight stories high, the main office to be in the first floor, with the entrance on Calvert street. Since then, however, the telegraph line and express company have been organized and in order to provide accommodations for them an entire change has been necessitated in the architecture of the building. The plans have not yet been determined upon except in regard to the main floor, on which will be located the ticket office, the express office and the telegraph office. The latter will be on the corner, with entrance on Baltimore street, running back to Bank lane. Next to it will be the ticket office, running back also the same depth, while the telegraph office will come next and take up the remainder of the Baltimore street front. Another radical change will be in the height of the structure, which will be five instead of eight stories. The exact time for the commencement of work has not been determined upon."

Chicago & Lake Huron.—The Chicago & Northeastern Company recently petitioned the Court to direct the Receiver of this road to exchange business on equitable terms, charging that the rates on through business had been fixed so high that the Northeastern was unable to take freight offered. Receiver Peck filed an answer denying the charges, and the matter was referred to a Master to take testimony.

Chicago & Northwestern.—Local papers report that this company will extend its Iowa Midland line this season from Anamosa, Ia., westward through Linn and Buchanan Counties to a point not yet decided on.

Chicago, Rock Island & Pacific.—A branch from Dexter, Ia., by Redfield to Panora, about 20 miles, will probably be built this season.

The following brief statement for the year ending March 31 is published in advance of the annual report:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Gross earnings.....	\$9,409,833	\$7,895,870	I. \$1,513,963	19.2
Expenses.....	5,079,872	4,384,514	I. 695,358	15.9
Net earnings.....	\$4,329,961	\$3,511,356	I. \$818,605	23.3
Interest on bonds.....	589,830	652,325	D. 62,495	9.5
Interest on Keokuk & Des Moines bds.....	350,000	350,000		
Rent, Peoria & B. V. road.....	68,750		I. 68,750	
Total charges.....	\$1,133,580	\$1,127,325	I. \$6,255	0.5
Surplus.....	\$3,196,381	\$2,384,031	I. \$812,350	34.1

This shows a great improvement.

Cincinnati, Hamilton & Dayton.—The committees representing this company and the Cincinnati, Hamilton &

Indianapolis bondholders having been unable to agree, have submitted their differences to arbitrators, whose award is to be final.

Cincinnati, Mt. Airy, Venice & Liberty.—This company has been organized to build a short suburban line out of Cincinnati.

Cincinnati Southern.—On the Chattanooga end of the line the track is now laid from the junction with the Western & Atlantic at Boyce's Station, Tenn., five miles from Chattanooga, north by east to Dayton, a distance of about 30 miles. The track is ballasted almost as fast as laid.

The Cincinnati Sinking Fund Commissioners have approved the form of lease proposed by the Trustees of this road to be made to E. W. Woodward and associates. A protest from the old Common Carrier Company against the transfer of the lease was received and filed.

The new company has now organized and its entire capital stock of \$1,000,000 has been subscribed. It is expected to take possession of the road in a few days.

Columbus, Chicago & Indiana Central.—The meeting of bondholders in New York, May 15, was largely attended. The committee presented a report which is substantially as follows:

"Judge Harlan's decision, while declaring the lease valid, requires the bondholders to reduce their bonded indebtedness to \$15,821,000 at 7 per cent. interest, the residue to be represented by convertible income bonds, consisting of part of the \$10,000,000 issue. They are given until Jan. 1, 1880, to accomplish this reduction, in default of which the Pennsylvania Railroad Company may then apply to have the lease rescinded. Further argument is to be had before Judge Harlan at Chicago on June 2 to determine the terms of payment of the back rentals, amounting to date to \$3,400,000 above all payments heretofore made on account. The reduction must be made by the first consolidated mortgage bondholders. There are outstanding sectional bonds which are a lien on the road prior to the \$10,428,000 of the consolidated first-mortgage bonds, amounting to \$7,000,000 or thereabouts. During the four years that the road has been in the receivers' hands the net earnings, according to the sworn reports of the Pennsylvania Railroad Company, have aggregated \$500,000 less than the amount required to pay the interest on the prior sectional bonds. The sectional and first consolidated mortgage bonds together exceed the limit set by Judge Harlan by more than \$1,400,000, exclusive of interest. There is, besides, a claim that has been many years in litigation under the Pullman mortgage, amounting now with interest to \$1,200,000, which must come in ahead of the first consolidated mortgage bonds. The committee insist that this mortgage covers only 27 miles of a branch road between Richmond and Newcastle, of little value to the main line, and that, should it be given up, the Pennsylvania Railroad Company will be entitled only to an abatement of rental proportionate to its value. That company claims that it would break the lease and Mr. Pullman claims that the mortgage extends to other portions of the road. It is impossible to say what amount will have to be paid to settle this claim, but the committee believe less than one-third the sum asked. There is also in excess of Judge Harlan's limit \$2,450,000 of consolidated second-mortgage bonds owned by individual holders, and \$1,240,000 of similar bonds owned by the Pennsylvania Railroad Company, which latter are subject to an agreement that they may be exchanged for income bonds whenever the absolute indebtedness of the company is reduced to Judge Harlan's figures. There are, furthermore, claims for right of way and depot grounds unpaid equal to \$100,000 or more. To effect the necessary reduction the committee propose the following plan:

"1. To pay off, out of the back rentals, the excess of \$1,400,000 of sectional and consolidated first-mortgage bonds. Of the former \$666,500 are 10 per cent. bonds, which constitute a prior lien on 60 miles of the road running out of Indianapolis. The committee have no hope of obtaining these at a discount, but they may be retired at par on 60 days' notice. The other sectional bonds should, in the opinion of the committee, submit to a reduction. If unable to purchase them on satisfactory terms, the committee to have the option of purchasing first consolidated mortgage bonds instead.

"2. If Mr. Pullman will accept a reasonable compromise, to pay him out of the back rentals, and if not to continue the fight with him, and deposit a sufficient number of consolidated first-mortgage bonds to abide the decision of the courts.

"3. To convert the \$2,450,000 of second-mortgage bonds into income bonds, wiping out accrued interest. Those holders who come into the agreement to be allowed 10 per cent. of the par value of their holdings in cash out of the back rentals. Holders to deposit their bonds and sign the agreement before June 1. An order of the court to be obtained authorizing the payment of the 10 per cent.; if refused, the second-mortgage bondholders to be at liberty to withdraw from the agreement.

"4. Second-mortgage bondholders who refuse these terms to be cut off by foreclosure of the first mortgage.

"5. Let an extension of time after Jan. 1 should be found necessary, and in order to furnish security for carrying out the order of Judge Harlan, the first consolidated mortgage bondholders to sign an agreement and to deposit their bonds under the following conditions: The Trustees and Receivers to be authorized to select by lot from the bonds so deposited an amount equal to the Pullman claim and the aggregate of non-assenting second-mortgage bonds, or such portion of the back rental as may not be used for other purposes, or such lesser amount of either as the court may on application deem sufficient. These bonds or this money to be placed on special deposit in some trust company. In case they have to be given up, the loss to be made good to the owners by all the first consolidated mortgage bondholders, *pro rata*, and an order of the court to be obtained for that purpose.

"In order to provide for unforeseen contingencies, the Committee, Trustees and Receivers to be authorized to make such modifications and take such steps as they may deem necessary, with the approval of a specified majority of the bondholders."

This report was explained and supported by a long speech from Mr. Southmayd, Counsel for the Committee.

At its close the meeting unanimously resolved to approve the plan of the Committee, who were requested to have the necessary documents prepared for the acceptance of the bondholders. The meeting then adjourned.

Dakota Central.—This company has filed articles of incorporation in Dakota for a road from the Minnesota line to the Missouri River near Fort Pierre. At the Minnesota line it will connect with the Chicago & Dakota, recently organized to build thence to Tracy on the Winona & St. Peter. The company is organized in the Chicago & Northwestern interest, and the road, if built, will give that company a line approaching the Black Hills country very nearly.

Denver & Rio Grande.—The subscriptions to the loan of \$5,500,000 for the proposed new extensions amount to about \$10,000,000 in all. The bonds will be allotted to subscribers this week, those who take less than \$10,000 receiv-

ing the amount in full, and the balance being divided pro rata among those subscribing for amounts over \$10,000.

Denver, South Park & Pacific.—The track on this road has been laid to Kenosha Summit, Col., eight miles beyond the late terminus at Webster, and 77 miles from Denver. At this point the track is 10,140 feet above the level of the sea, the highest elevation yet attained by a railroad in North America, and 801 feet higher than the Denver & Rio Grande at the summit of the Sangre del Christo range. Most of the difficult work is now done, and construction will proceed rapidly toward Leadville, over a comparatively easy line.

Detroit, Lansing & Northern.—It is said that the repair shops will be removed from Ionia, Mich., to Lansing, where 50 acres of land have been offered the company on condition that the change is made.

Eastern Extension.—Work on this road has been resumed, and the track is now being laid from New Glasgow, N. S., eastward toward Antigonish.

Fitchburg.—The board of directors has voted to authorize the President to give the necessary notice of withdrawal from the Hoosac Tunnel Line. It also voted to authorize the President to terminate the contract under which the company runs its trains over the Troy & Greenfield road. The reason stated is that the tolls now charged are so high that the business can only be done at a loss, and that there has actually been for some time a deficit on the through traffic.

Galena & Wisconsin.—This company has been organized by the purchasers of the Galena & Southern Wisconsin road at the recent sale. The articles of incorporation cover an extension of the road from its present terminus at McCormack, 40 miles from Galena, to Muscoda and Platteville.

Grand Trunk.—The Canadian Parliament has passed the bill authorizing the government to buy the Riviere du Loup Division of this road for \$1,500,000. This division runs from Chaudiere Curve, eight miles from the Quebec terminus, down the south side of the St. Lawrence to Riviere du Loup, 117 miles. Its building was forced upon the Grand Trunk for political reasons, and it has never been a profitable line, the country being inhabited by a people who travel very little and do not produce much for export. Since the Intercolonial was built there has been a good deal of controversy over this line, the Grand Trunk declining to spend money to put it in better condition. This is now settled by the purchase, which will extend the Intercolonial line to Point Levis, opposite Quebec, as the government will probably build a separate track for the eight miles from Chaudiere to Point Levis.

According to the statements made at the recent half-yearly meeting in London, the Grand Trunk will use the \$1,500,000 in securing its Chicago connection.

Hannibal & St. Joseph.—Notice is given that 25 bonds of the sinking-fund land-grant issue have been drawn for redemption, and will be paid on presentation to the Farmers' Loan & Trust Company in New York. Interest will cease July 15. The numbers drawn are: 13, 25, 75, 90, 100, 115, 129, 202, 220, 278, 295, 300, 313, 328, 341, 382, 458, 485, 487, 496, 553, 593, 619, 637, 645.

Hartwell.—An effort is being made to secure subscriptions for this road in Atlanta. It is to run from Hartwell, Ga., southwest about 16 miles to a connection with the Elberton Air Line road.

Indianapolis, Delphi & Chicago.—Enough local aid has been voted to this road to secure its extension from Monticello, Ind., southeast to Delphi and thence toward Indianapolis.

Iowa City & Western.—A contract has been let to Mr. Dows, of Cedar Rapids, Ia., to grade this road from Iowa City, Ia., westward to Webster, about 54 miles. The line is now being located.

Jacksonville, Northwestern & Southeastern.—In the Circuit Court at Jacksonville, Ill., May 17, a decree of foreclosure and sale was entered against this road at the suit of M. P. Ayers and other bondholders. The road extends from Jacksonville, Ill., to Virden, 31 miles, and has a bonded debt of \$610,000. It is stated that the bondholders will buy in the road and extend it.

Kansas Central.—The purchasers of this road have organized a new company, and profess their willingness to extend the road westward, if a reasonable amount of aid is subscribed.

Kansas City, Emporia & Southern.—This new branch of the Atchison, Topeka & Santa Fe is now graded from Emporia, Kan., southward to Madison 20 miles, and track has been laid for 5 miles. The bridge over the Cottonwood is completed and that over the Verdigris is well advanced. From Madison the line is to run through the valley of the Verdigris, a very good country.

La Crosse & Omaha.—This company has been organized at La Crosse, Wis., to build a railroad from that city southwest across Minnesota and Iowa to Council Bluffs.

Levis & Kennebec.—The 88,826 shares of stock of this company held by La Rochelle & Scott, the contractors, were recently sold by their assignees in bankruptcy for \$15,100, to Mr. Wyatt, who is understood to buy the stock for account of the bondholders.

Louisville Branch.—Surveys for this road have been completed, and the contract for grading has been let to W. T. Wheelers, of Atlanta, Ga., who will employ convict labor chiefly. The road will be 10 miles long, from Louisville, Ga., by Bethany and Pine Hill to Wadley on the Central Railroad, of Georgia. The Central agrees to iron the road when graded, and will lease and work it as a branch.

Minneapolis & Northwestern.—It is said that this company has accepted a proposition from Col. Phelps, late of Springfield, Mass., to build and equip 60 miles of its projected road from Minneapolis, Minn., westward for \$5,500 per mile, \$3,000 payable in bonds. The company has secured \$150,000 in subscriptions to the stock, and more has been offered.

Missouri & Western.—St. Louis papers report that this road has been sold to the St. Louis & San Francisco Company and will be extended from Oswego, Kan., westward 145 miles to Wichita. It is now in operation from Carthage to Pierce City, Mo., 73 miles, with a branch of 10 miles to Joplin.

Montgomery & Eufaula.—This road does not pass directly to the Central, of Georgia, on account of some legal difficulties in the way of the proprietor. It is operated at present by "Wm. M. Wadley, Proprietor," but the officers are the same as the Southwestern, of Georgia. Mr. Wadley will probably continue to work the road until legal arrangements for the transfer can be made.

New London Northern.—The round-house at New London, Conn., was burned down on the morning of May 21, and four engines badly damaged, causing a loss of \$20,-

000, which is covered by insurance. The shops adjoining were only saved by hard work.

New York & Greenwood Lake.—This company is considering the question of building the branch from Montclair, N. J., to Caldwell, which was partly graded several years ago. The right of way is offered and the money necessary to complete a part of the line. A tunnel is required, on which some work has been done.

New York, Lake Erie & Western.—An experimental train with a dynamometer car has lately been run from Buffalo to Jersey City with a view of deciding some questions as to the work done on the various divisions, and the trains which engines should draw on each.

A dispatch from London, May 20, says: "A large meeting of the bondholders and shareholders of the Erie Railway Company was held to-day to receive the report of the Reconstruction Trustees. Sir Edward Watkin presided, and read a report of the Erie Railway Company up to Sept. 30, 1878, and the accounts of the Reconstruction Trustees, which the meeting received very favorably. Resolutions were unanimously adopted approving the Trustees' Report and accounts; also, expressing the satisfaction of the English proprietors that a large interest in the company's bonds and stocks is being taken by American holders, from whom this meeting trusts that the board may be gradually strengthened by the addition of a high class of business men, having a substantial holding in the company. There was no dissent from the generally favorable view taken by the trustees of the present condition of the property. Sir Edward Watkin and the various speakers expressed their friendliness toward an arrangement with the Atlantic & Great Western Railroad Company, if it can be made without prejudice to the Erie Railway proprietors."

New York & New England.—This company has begun work on a branch 1½ miles long, from Charles River Station, Mass., on the Woonsocket Division, to the Ridge Hill Farm of Wm. E. Baker in Wellesley. The branch will open a new route to Mr. Baker's hotel and pleasure grounds.

New York, New Haven & Hartford.—According to a recent order, trip, quarterly and yearly passes over this road can hereafter be issued only by the President and Vice-President. Division Superintendents can issue trip passes only to employees of the road and over their own division. The order also forbids the issue of passes to families of employees, who have heretofore been allowed to ride free.

New York & Oswego Midland.—The Committee representing the holders of Receivers' certificates and first-mortgage bonds gives notice that it now holds 85 per cent. of both classes of securities. Such other holders as may desire to join in the purchase of the road must deposit their bonds or certificates with the Committee at the Third National Bank in New York on or before June 10. The sale of the road is now advertised for June 28 next.

North Pennsylvania and Delaware & Bond Brook Lease to the Reading.—There is but little to be added to the announcement of the leases as made last week. The depot of the New York & Philadelphia New Line in Philadelphia is to be removed as soon as possible to Ninth and Green streets, the depot of the Germantown & Norristown Branch of the Reading, a more central and convenient location than the North Pennsylvania station. President Gowen announces that the profit which the Readings expects to find in the leases is in the saving of freight on the coal which it delivers in New York and vicinity. He also announces that the lease will not in any way interfere with the Lehigh Valley business between Bethlehem and Philadelphia.

Olympia.—An extension has been located for this road from Tenino, Washington Ter., to a point of the Chehalis River, and the company intends to put a light-draft steamer on the river as a feeder to the road.

Omaha & Republican Valley.—Tracklaying has been begun on the extension of this road from County Line, Neb., westward through Polk County.

Pennsylvania.—This company has now a street crossing fight on its hands. The City Solicitor of Lancaster, Pa., acting under orders of the City Council, has begun a large number of suits against the company for violation of ordinances regulating the speed of trains through the city.

Pennsylvania Railroad in Maryland.—The first rail on this road was laid with much ceremony May 20, at Ellerslie, six miles from Cumberland, Md. The road is to extend the Bedford Division of the Pennsylvania from State Line to Cumberland.

Peoria, Pekin & Jacksonville.—It is stated that a controlling interest in the stock of this company has been bought by parties who are largely interested in the Toledo, Peoria & Warsaw and Warsaw roads. The road extends from Peoria, Ill., to Jacksonville, 85 miles, and has been for some time in the hands of a Receiver, Mr. John Allen, who is also President and one of the largest stockholders. The Toledo, Peoria & Warsaw uses nine miles of its track, from Peoria to Hollis, and the object of the purchase was to secure the use of this to itself, and also to make sure of the business of the road.

Pittsburgh & Lake Erie.—It is said that this company is arranging for a connection with the Baltimore & Ohio at Pittsburgh with a view to securing a share of the coke traffic from the Connellsville Region, which is already very large and is increasing very fast.

Portland & Rochester.—A meeting of bondholders was held in Portland, Me., May 13, to consider the propriety of purchasing the city's interest at \$200,000. After debate a committee was appointed to visit bondholders not present, and see if they will agree in writing to purchase the city's interest; also to confer with the city committee and call a legal meeting of the bondholders.

Potomac & Ohio.—Work is said to be in progress on this road near Charleston, W. Va., and in the Shenandoah Valley near Harrisonburg, Va. The road is intended to open up some large tracts of coal, mineral and timber lands; it is to be of 3 ft. gauge and about 350 miles long, starting from Charleston and running up Elk River and into the Valley of Virginia near Harrisonburg. Thence it will pass through Swift Run Gap and across Eastern Virginia to the Potomac at Quantico.

Quebec, Montreal, Ottawa & Occidental.—A line has been located for an extension from the present depot in Quebec to deep water. It will pass through several streets and will have spurs running to all the principal wharves on the harbor.

Richmond, Fredericksburg & Potomac.—The board of directors has approved a contract with the Potomac Steamboat Company for a connection by river between Quantico and Washington with the day train to and from Richmond, to begin June 1. The contract is for four years, and to continue thereafter until terminated on six months' notice from either party. The steamboat company is to

provide a suitable iron boat, capable of running 18 miles an hour and cutting through any ordinary ice.

It is probable that a suit to enjoin this contract will be begun by the Virginia Board of Public Works, joined by part of the private stockholders.

St. Louis, Iron Mountain & Southern.—Preparations have been begun for the intended change of the gauge of this road from 5 ft. to 4 ft. 8½ in. Machinery for changing the wheels is already in place. It is thought that everything will be in readiness about Aug. 1, and the whole line from St. Louis to Texarkana can be changed in one day. This will be the second change, the road having been originally 5 ft. 6 in. like the other Missouri roads. When 5 ft. was adopted its chief business was over its Southern line to Belmont and with the Southern roads, and the great development of the Texas business was not expected.

St. Paul & Pacific.—The sale of this road under foreclosure, to complete the transfer to the new owners, has begun by the sale of the Branch Line, as noted elsewhere.

A contract has been let to Harrison, Langdon & Shepard, of Minneapolis, Minn., for the extension of the St. Vincent Extension from Alexandria, Minn., northwest to Barnes, filling the gap in the Extension as originally planned. The distance is about 90 miles, and includes some heavy work.

Securities on the New York Stock Exchange.—The following securities have recently been put on the list at the New York Exchange:

Additional stock and bonds of the New York Elevated Railroad Company, as follows: 15,000 shares of stock and \$1,500,000 bonds, making the whole amount of securities on the list \$6,500,000 stock and \$8,500,000 bonds.

Chicago, St. Louis & New Orleans Tennessee lien bonds, of which \$1,190,000 are to be issued; first consolidated-mortgage bonds, the total authorized issue being \$11,801,000; second-mortgage bonds (interest for five years payable, if earned), of which the total authorized issue is \$8,000,000; and stock, the total authorized issue of which is \$10,000,000, although only \$8,663,650 have been issued.

Frankfort & Kokomo bonds amounting to \$200,000, and stock amounting to \$600,000.

Chesapeake & Ohio purchase money funding bonds, 6 per cent. mortgage gold bonds, and 6 per cent. mortgage currency bonds, and first and second preferred stock.

Southern Pacific.—Track on this road has been laid to Casa Grande, Arizona, 183 miles east of Yuma, and 26 miles beyond the late terminus at Maricopa Wells. A terminal station has been temporarily established at Casa Grande and the train runs to that point, which is 914 miles from San Francisco. Work is progressing steadily toward Tucson.

Tennessee State Railroad Bonds.—The committee of Tennessee bondholders have issued a circular to their constituents announcing that after full deliberation, with advice of counsel, and with the approval of prominent houses interested, and of large individual holders in New York, Baltimore, Philadelphia and Chicago, they have decided to adopt the suits lately instituted by Mr. C. Amory Stevens, and hope, with prompt action on the part of the bondholders, to bring these suits to trial during the ensuing summer. Among the considerations upon which they base their confidence in a successful enforcement of the lien, they quote the language of the State Agent when offering for sale Tennessee bonds of the new issue in behalf of the railroads. The latter distinctly says that the purchasers will have the railroads as security. They also quote Governor Brownlow's Message to the Legislature in 1868, in which he takes similar ground, and says that the state, in point of honor and fact, holds the lien in a fiduciary capacity in trust for the bondholders. They further call attention to the fact that in 1878 the railroads virtually recognized their obligations by compromising the Mobile & Ohio case, then pending on appeal before the Supreme Court of the United States. In that suit the question whether or not the holders of Tennessee bonds had a first-mortgage lien upon railroads in that state was clearly presented. In conclusion, the opinion of Charles O'Connor is cited. Regarding the adverse opinion prepared by Evans, Southmayd & Choate, the committee say that those gentlemen base their conclusions on the Minnesota case, so far as it is at all applicable to the Tennessee case. The Minnesota case was cited by the railroads in the Mobile & Ohio case, but it was not then sufficiently convincing to prevent them from offering a settlement.

The amount of bonds which are claimed to be liens against the various roads are as follows: East Tennessee, Virginia & Georgia, for East Tennessee & Virginia, \$1,318,000; for East Tennessee & Georgia, \$614,000; for Cincinnati, Cumberland Gap & Charleston, \$350,000; for East Tennessee & Western North Carolina, \$34,000; total, \$2,316,000. Memphis & Charleston, \$830,000. Louisville & Nashville, direct, \$298,000; for Memphis, Clarksville & Louisville, \$791,000; for Memphis & Ohio, \$1,176,000; for Tennessee & Alabama, \$468,000; for Central Southern, \$363,000; total, \$3,095,000. St. Louis & Southeastern, for Edgefield & Kentucky, \$645,000. Nashville, Chattanooga & St. Louis, direct, \$114,000; for Nashville & Northwestern, \$1,385,000; for Winchester & Alabama, \$457,000; for McMinnville & Manchester, \$356,000; total, \$2,312,000. Mobile & Ohio, \$653,000. Chicago, St. Louis & New Orleans, for Mississippi Central, \$480,000. Knoxville & Ohio, for Knoxville & Charleston, \$514,000.

The total amount of these bonds is \$11,647,000, or with accrued and unpaid interest, \$14,325,710. The new bonds and funding-series bonds, not included above, are likewise, it is claimed, statutory liens on the roads.

Tyler Tap.—The name of this road has been changed to the Texas & St. Louis Railroad. Arrangements are being made to extend the road northwest to Texarkana, and south-west to Austin.

Wabash.—At a special meeting held May 14, the stockholders voted to authorize the proposed issue of bonds to the amount of \$2,000,000 to retire the Seney mortgage, and for other purposes.

Concerning the proposed Detroit Extension, a committee from that city recently had a conference with the board of directors in Toledo, of which the Detroit Post and Tribune says: "The conference of the Detroit committee with the Wabash directors continued until a very late hour. The whole matter was canvassed in all its phases. The result is that everything is left in an entirely unsettled condition. The Wabash people are anxious to go to Detroit, not only to connect with the Grand Trunk and Great Western, but for Detroit business; but there is strong opposition, and many difficulties are in the way. Possibly these may prove too great to overcome. There is still hope, however, that if Detroit does its duty the road may be secured. This will depend on future contingencies, and the course pursued by Detroit's citizens."

Wabash and Cleveland, Columbus, Cincinnati & Indianapolis Pool.—It is stated that an agreement has been concluded between these companies to pool their traffic from competing points. The terms of the agreement are not given.

ANNUAL REPORTS.

Concord.

This company owns the Concord Railroad from Concord, N. H., to Nashua, 35 miles; the Hooksett Branch, 7 miles, and the Manchester & North Weare road, 19 miles. It leases the Concord & Portsmouth road from Manchester, N. H., to Portsmouth, 40.5 miles, and the Suncook Valley road, from Hooksett to Pittsfield, 19.5 miles, making 121 miles worked. It also leases the Nashua, Acton & Boston road, 20 miles, but its earnings are not included. Part of the business is done under an arrangement for division with the Manchester & Lawrence road. The 38th annual report is for the year ending March 31, 1879.

The equipment consists of 38 locomotives, 60 passenger-train cars, 923 freight cars and 24 service cars.

The general account is as follows:

Stock (\$24,500 per mile).....	\$1,500,000.00
Det. and contingent.....	153,230.00
Notes payable.....	42,933.22
Interest.....	58,086.70
May dividends.....	75,000.00
Old dividends, etc.....	2,737.00
Total.....	\$1,831,975.98

Construction.....\$1,500,000.00
 Bridge's wharf.....51,507.72
 Leased lines, etc.....138,672.90
 Cash and receivables.....141,705.36
Total.....1,831,975.98

Notes payable were reduced \$50,000 during the year. The company has no bonded debt whatever.

The work done was as follows:

Train mileage:	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passenger.....	1878-79.	1877-78.		
Freight.....	247,157	255,319	D.	8.162
Service.....	32,047	24,178	I.	7.809
Switching.....	130,731	135,020	D.	4.280

Total.....	613,819	617,354	D.	3.535
Passengers carried.....	480,004	509,203	D.	19.290
Passenger mileage.....	10,580,508	10,856,140	D.	2.753
Tons freight carried.....	674,857	673,471	I.	1.386
Tonnage mileage.....	21,009,056	21,034,069	D.	25.613

Average train load:
 Passengers, number.....51.89
 Freight, tons.....87.42

The tonnage of the Nashua, Acton & Boston road was 39,192 tons carried, equal to 917,007 tons carried one mile.

The earnings for the year were as follows:

	1878-79.	1877-78.	Inc. or Dec.	P. c.
Passenger.....	\$278,321.01	\$280,081.00	D.	37.700
Freight.....	424,954.08	452,046.07	D.	27.091
Express, mail, etc.....	29,738.51	33,044.42	D.	3,315.91
Total.....	\$733,013.60	\$765,171.49	D.	\$32,157.88

Expenses.....	\$733,013.60	\$771,171.58	D.	\$38,157.98
Total.....	\$733,013.60	\$771,171.58	D.	\$38,157.98
Net earnings.....	\$318,847.09	\$340,453.93	D.	\$21,606.84
Gross earn. per mile.....	0.057.80	0.373.32	D.	315.43
Net earn. per mile.....	2.634.65	2.813.67	D.	179.02
Per cent. of expenses.....	56.50	55.85	I.	0.65

The reduction in expenses has not quite kept pace with that in earnings. The income account was as follows:

Net earnings.....	\$318,847.09
Taxes on capital stock.....	\$35,435.28
Manchester & Lawrence, joint business.....	69,892.41
Rent of Concord & Portsmouth.....	25,000.00
Rent of Suncook Valley.....	8,004.00
Rent of Nashua, Acton & Boston.....	11,000.00
On account N. A. & B. rolling stock.....	18,707.08
Dividends, 10 per cent.....	150,000.00
Total.....	\$318,229.37

Balance to contingent fund.....\$617.72

During the year 498 tons of steel, 573 tons iron rails and 83,673 new ties were laid; 898 tons of iron rails were repaired and relaid. There were 3,584 feet of new sidings laid, and some ballasting done. A new bridge was built at Thornton's Ferry. Some new station buildings were built. A new passenger house at Nashua is needed. A new passenger engine was bought and another ordered. All renewals were charged to expenses. Amount of materials on hand was reduced \$18,896.46, over one-third by lower valuation.

There was not only a small loss of traffic, but a considerable reduction in the rates received on through business, and there was also a decrease in mail pay. These losses were so far offset by cutting down expenses that the company was able to continue its usual dividend.

Utica & Black River.

This company owns a line from Utica, N. Y., to Philadelphia, 87 miles. It leases the Carthage, Watertown & Sackett's Harbor, a branch from Carthage to Sackett's Harbor, 30 miles; the Clayton & Theresa, a branch to Clayton on the St. Lawrence, 16 miles; the Black River & Morristown, which extends the main line to Morristown, 37 miles, and the Ogdensburg & Morristown, which extends it 10 miles further, to Ogdensburg, making 180 miles worked. The last-named road was built last year, and worked for a little less than two months of the fiscal year, which is that ending Sept. 30.

The Ogdensburg & Morristown is substantially owned, the lessee holding nearly all the stock; the Carthage, Watertown & Sackett's Harbor is leased for 37½ per cent. of gross earnings, and the other roads for the interest on their bonds.

The equipment consists of 18 locomotives; 23 passenger and 10 baggage cars; 210 freight cars. Four passenger and one baggage car were added during the year.

The general account is as follows, condensed:

Stock (\$30,365 per mile).....	\$1,771,730.00
Bonds (\$12,872 per mile).....	1,112,000.00
Sundry accounts and balances.....	57,808.41
Surplus fund.....	168,955.65
Total.....	\$3,110,484.06

Road and equipment (\$32,157 per mile).....\$2,797,638.11
 Leased lines, stocks, bonds and advances.....293,007.93
 Sundry accounts.....6,359.61
 Cash.....13,478.41
Total.....\$3,110,484.06

Expenditures for new construction and equipment on the line owned were last year \$21,300.08. Total construction charges up to the close of the year on account of lines owned and leased were \$232,164.05, of which \$79,487.50 have been repaid by sale of bonds, leaving \$152,726.55 due operating account. The Ogdensburg & Morristown road cost \$111,574.29; the Ogdensburg subscription was \$6,347.63, and stock subscribed by this company \$111,800, so that there is a balance of \$6,578.34 on hand.

The earnings for the year were as follows:

	1877-78.	1878-79.	Inc. or Dec.	P. c.
Passengers.....	\$183,316.33	\$185,109.03	D.	1.792
Freight.....	248,461.48	246,750.50	I.	1.710
Other sources.....	21,397.11	21,717.34	D.	350.23
Total.....	\$453,174.92	\$453,576.87	D.	\$401.95
Expenses.....	213,852.62	233,568.02	D.	19,713.40
Total.....	\$239,322.30	\$220,010.85	I.	\$19,311.45
Gross earn. per mile.....	2.649.97	2.608.10	D.	18.13
Net.....	1,399.37	1,294.18	I.	105.19
Per cent. of expenses.....	47.16	51.50	D.	4.31

The income account was as follows:

Net earnings.....	\$239,322.30
Rents, interest and premium.....	16,346.31
Total.....	\$255,668.61
Interest.....	\$77,840.00
Rentals.....	60,239.04
Dividends, 4 per cent.....	70,832.00
Total.....	\$208,911.04

Balance, surplus.....\$40,727.57
 Add surplus, Sept. 30, 1877.....126,228.08
Total.....\$168,955.65

The surplus is chiefly represented by advances to leased lines. It was deemed best to retain the cash part of it to meet emergencies, instead of increasing dividend.

There was carried last year 103,560 tons of freight, an increase of 2,783 tons, or 2.8 per cent. The chief increase was in grain and stock; there was a slight decrease in lumber and but little change in other articles. Business continues light, on account of general depression, and this also decreases rates. Improvement is looked for only as general business grows better.

The Ogdensburg Extension is doing well, and promises to be a good investment.

The committee of stockholders appointed for that purpose, reports that the property is in very good condition and the management very satisfactory.

Providence & Worcester.

This company owns a line from Providence, R. I., to Worcester, Mass., 43.41 miles; the East Providence Branch, 7 miles, and the Worcester Depot Branch, 1 mile, making 51.41 miles owned. It leases the Milford & Woonsocket road, 3.88 miles, and the Hopkinton road, 11.55 miles, making 66.84 miles worked. There are 30.65 miles second track, and 28 miles of sidings. The report is for the year ending Sept. 30.

The equipment consists of 30 engines; 41 passenger-train cars and 1,282 freight cars.

The general account is as follows:

Stock (\$38,903 per mile).....	\$2,000,000.00
Bonds (\$22,875 per mile).....	1,176,000.00
Notes payable and unclaimed dividends.....	629,130.28
Profit and loss.....	110,584.01
Total.....	\$3,915,714.89
Road and equipment (\$72,350 per mile).....	\$3,719,521.89
Cash, materials and receivables.....	196,193.00
Total.....	\$3,915,714.89

Bonds were increased by the issue of \$676,000 new bonds used to retire the floating debt. Charges to construction account were \$42,436.85, and \$14,500 was deducted for estimated depreciation of locomotives.

The work done for the year was as follows:

Train mileage:	1877-78.	1878-79.	Inc. or Dec.	P. c.
Passenger.....	227,153	223,500	I.	3.633
Freight.....	231,770	236,226	D.	104.456
Service and switching.....	93,900	17,035	I.	76.805
Total.....	552,823	576,721	D.	23,958
Passengers carried.....	1,627,247	1,570,098	I.	57,179
Passenger mileage.....	13,973,108	13,592,849	I.	380,259
Tons freight carried.....	634,722	641,135	D.	16,413
Tonnage mileage.....	17,916,241	18,802,705	D.	946,464
Av. train load:				
Passengers, number.....	61.50	60.82	I.	0.38
Freight, tons.....	77.29	56.11	I.	21.18
Av. rate:				
Per passenger per mile.....	2.36 cts.	2.31 cts.	I.	0.05 ct.
Per ton per mile.....	2.90 "	2.90 "	D.	0.09 "

The passenger-train load is very large, few roads reporting so high an average.

The earnings for the year were as follows:

	1877-78.	1878-79.	Inc. or Dec.	P. c.
Passengers.....	\$330,385.85	\$324,106.98	D.	\$6,278.87
Freight.....	519,98.02	504,008.77	D.	44,412.15
Mail, etc.....	20,983.70	21,895.33	D.	901.63
Total.....	\$870,876.17	\$850,011.08	D.	\$20,865.09
Expenses.....	\$860,061.10	\$859,335.87	D.	\$724.23
Total.....	\$870,876.17	\$859,335.87	D.	\$20,865.09
Net earnings.....	\$200,815.07	\$250,675.21	I.	\$49,860.14
Gross earn. per mile.....	13,029.37	13,914.77	I.	585.50
Net.....	4,350.91	3,750.35	I.	600.56
Per cent. of exps.....	66.61	72.45	D.	5.84

Earnings for the year showed a gain in passengers, but a loss in freight, causing a total decrease, which was more than balanced by the reduction in expenses. The income account was as follows:

Net earnings.....	\$200,815.07
Decrease of property on hand.....	51,721.12
Bonds sold (\$676,000) and premium.....	686,671.50
Total.....	\$1,039,207.69
Construction and equipment.....	\$42,436.85
Rentals.....	10,980.00
Interest.....	93,357.12
Dividends, 4 per cent.....	80,000.00
Reduction of floating debt.....	812,433.72
Total.....	\$1,039,207.69

During the year 10 miles of steel rails were laid, several bridges rebuilt and the expensive work of rebuilding Woonsocket bridge for double track completed. The passenger equipment has been fitted with the Westinghouse automatic brake. It is recommended that new shops be built out of Providence, and the site of the present shops be taken for additional freight yards and depot. The prospects of the company are improving.

Pennsylvania & New York.

This road, which is substantially owned by the Lehigh Valley Company, extends that line from Wilkesbarre, Pa., northwest to the Erie at Waverly, N. Y., 105 miles. It was built on the line of the old Pennsylvania & New York Canal, a short section of which in Wilkesbarre is still in use. The report is for the year ending Nov. 30, 1878. It gave the following statement of track owned, which was increased by 9.17 miles second track and sidings during the year:

	Miles.
Main Line, Wilkesbarre to New York State line.....	104.30
Second track in use as such.....	35.63
Sidings and second track used for sidings.....	51.74
Waverly & State Line R. R. and sidings.....	3.46
Branch and sidings connecting with Geneva, Ithaca & Sayre R. R.....	3.97
Branch and sidings connecting with Southern Central R. R.....	4.28
Sidings at Waverly.....	0.39
Sidings at Elmira.....	0.58
Branch and sidings connecting with Barclay R. R.....	3.07
Pleasant Valley Branch.....	5.82
Sidings at West Pittston.....	1.23
Sidings and short branches to coal breakers.....	5.35
Total track.....	219.82

There are 86.83 miles laid with steel. During the year 11,927 new steel rails, 1,523 iron rails and 59,470 new ties were put in the track.

The equipment consists of 50 locomotives; 256 box, 97

stock, 210 gondola, 57 platform, 900 coal and 34 caboose cars; 4 wrecking and 31 gravel cars. There were 11 box, 2 stock, 10 gondola, 1 wrecking and 2 caboose cars added during the year. Passenger equipment is furnished by the Lehigh Valley.

The traffic for the year was as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Passengers carried.....	1878.	1877.		
Passenger mileage.....	5,406,619	7,581,092	D.	2,174,473
Tons merchandise carried.....	650,344	451,729	I.	198,615
Tonnage mileage.....	57,818,607	38,710,072	I.	19,108,535
Tons coal carried:				
Anthracite.....	780,796	911,755	D.	130,959
Bituminous.....	314,567	340,501	D.	25,934
Total.....	1,095,363	1,252,256	D.	156,893
Coal tonnage mileage:				
Anthracite.....	88,410,511	81,085,080	D.	13,324,509
Bituminous.....	7,569,471	7,890,448	D.	320,977
Total.....	96,000,082	88,975,528	D.	7,024,554
Average rate per mile:				
Per passenger.....	2.73 cts.	2.08 cts.	I.	0.65 ct.
Per ton of merchandise.....	0.87 "	1.09 "	D.	0.22 "
Per ton of coal.....	0.97 "	0.83 "	I.	0.15 "

The chief loss in anthracite traffic was in that delivered to the Erie; in bituminous in tonnage going to the Southern Central. There were 59,694 tons coal shipped in return freight cars. Not included in above is 12,186 tons of coal dust, for which there is an increasing demand.

Earnings for the year were as follows:

Transportation of:	Gross earn.	Expenses.	Net earn.	Per ct. of exp.
Coal.....	\$744,043.69	\$418,041.76	\$326,001.93	56.19
Freight.....	504,947.30	365,303.43	139,643.87	72.34
Pass. express and mail.....	141,817.96	111,233.32	30,584.64	78.33
Canal earnings.....	432.75	1,847.28	Loss, 1,414.53	
Miscellaneous.....	33,226.06		33,226.06	
Total.....	\$1,424,467.76	\$886,425.79	\$538,041.97	62.93
Total, 1877.....	1,592,385.27	899,370.00	693,015.27	57.56
Decrease.....	\$137,917.51	\$2,944.21	\$134,973.30	
Per cent.....	8.82	0.03	20.35	

The report of Mr. Robert H. Sayre, President, says: "During the year \$210,000 has been paid for interest on bonds, leaving \$318,041.97 applicable to taxes, dividends, etc. * * *

"About nine miles of track have been laid during the year, four miles of which were in the main double track, and the balance in sidings. Over 3,000 tons of steel rails have been used in renewal of worn-out iron rails; the steel rails were charged to maintenance of way. The single-track wooden bridge over Wyalusing Creek, two spans of 114 feet each, has been replaced by a double-track iron structure. The single-track wooden bridge over the river at Towanda is being replaced by a double-track iron one, which will be completed early in the coming (present) year.

"Arrangements have also been made for substituting a double-track iron bridge for the single-track wooden one now in use over Wysox Creek; half the cost of these structures will be charged to maintenance of way and the balance to construction account.

"Foundations have been put in for the shops at Sayre, for the repairs